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ABSTRACT

State policies to encourage elementary teachers to teach for understanding and thinking are more comprehensive in California than in any other state. Based on in-depth interviews with eight curriculum and policy experts and an analysis of over 100 documents, this report describes efforts being advanced across six policy fronts: (1) curriculum frameworks; (2) handbooks for local program planning; (3) model curriculum guides; (4) statewide tests; (5) instructional materials adoption; and (6) inservice programs. Following an overview of California's policy design, the report provides a more detailed analysis of each of the six policy initiatives. The report next presents a qualitative assessment of the consistency, prescriptiveness, and authority of California's curriculum policies, and concludes that the policies generally satisfy each of the criteria. However, their impact on classroom practice will ultimately be determined by the state's level of success in pressing publishers to develop instructional materials aligned with current curriculum frameworks. The report lists the documents included in the content analysis. (LMI)

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Elementary Subjects Center
Series No. 16

CALIFORNIA'S CURRICULUM REFORM GUIDELINES FOR ELEMENTARY SCHOOLS: 1983-1988

Donald J. Freeman

Center for the Learning and Teaching of Elementary Subjects

Institute for Research on Teaching
College of Education
Michigan State University

U.S. DEPARTMENT OF EDUCATION
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Center for the Learning and Teaching of Elementary Subjects

The **Center for the Learning and Teaching of Elementary Subjects** was awarded to Michigan State University in 1987 after a nationwide competition. Funded by the Office of Educational Research and Improvement, U.S. Department of Education, the Elementary Subjects Center is a major project housed in the Institute for Research on Teaching (IRT). The program focuses on conceptual understanding, higher order thinking, and problem solving in elementary school teaching of mathematics, science, social studies, literature, and the arts. Center researchers are identifying exemplary curriculum, instruction, and evaluation practices in the teaching of these school subjects; studying these practices to build new hypotheses about how the effectiveness of elementary schools can be improved; testing these hypotheses through school-based research; and making specific recommendations for the improvement of school policies, instructional materials, assessment procedures, and teaching practices. Research questions include, What content should be taught when teaching for conceptual understanding and higher level learning? How do teachers concentrate their teaching to use their limited resources best? and In what ways is good teaching subject matter-specific?

The work is designed to unfold in three phases, beginning with literature review and interview studies designed to elicit and synthesize the points of view of various stakeholders (representatives of the underlying academic disciplines, intellectual leaders and organizations concerned with curriculum and instruction in school subjects, classroom teachers, state- and district-level policymakers) concerning ideal curriculum, instruction, and evaluation practices in these five content areas at the elementary level. Phase II involves interview and observation methods designed to describe current practice, and in particular, best practice as observed in the classrooms of teachers believed to be outstanding. Phase II also involves analysis of curricula (both widely used curriculum series and distinctive curricula developed with special emphasis on conceptual understanding and higher order applications), as another approach to gathering information about current practices. In Phase III, test models of ideal practice will be developed based on what has been learned and synthesized from the first two phases.

The findings of Center research are published by the IRT in the Elementary Subjects Center Series. Information about the Center is included in the IRT Communication Quarterly (a newsletter for practitioners) and in lists and catalogs of IRT publications. For more information, to receive a list or catalog, or to be placed on the IRT mailing list to receive the newsletter, please write to the Editor, Institute for Research on Teaching, 252 Erickson Hall, Michigan State University, East Lansing, Michigan 48824-1034.

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Abstract

State-level policies to encourage elementary teachers to teach for understanding and thinking are more comprehensive in California than in any other state (Freeman, 1989). Based on in-depth interviews with eight curriculum and policy-area specialists in the California State Department of Education and analysis of more than 100 documents, this report describes efforts being advanced across six distinct policy fronts: (a) curriculum frameworks, (b) handbooks for local program planning, (c) model curriculum guides, (d) statewide tests, (e) instructional materials adoptions, and (f) inservice programs. Following an overview of the design of California's policy framework, the report shifts to a more detailed analysis of each of the six policy initiatives. Then it presents a qualitative assessment of the consistency, prescriptiveness, and authority of California's curriculum policies, concluding that these policies generally satisfy each of these criteria but that their impact on classroom practice will ultimately be determined by the state's level of success in pressing publishers to develop instructional materials that align with the curriculum frameworks.

CALIFORNIA'S CURRICULUM REFORM GUIDELINES FOR ELEMENTARY SCHOOLS: 1983-1988

Donald J. Freeman[1]

I. INTRODUCTORY OVERVIEW

This study is part of a series of interrelated studies conducted by the Center for the Learning and Teaching of Elementary Subjects at Michigan State University. The central focus throughout the Center's work is teaching for understanding, thinking, and higher order applications at the elementary school level in each of six subject areas--mathematics, science, social studies, literature, music, and art. The initial phases of the Center's research agenda focus on descriptions of current practice related to this goal; the final phase will build on this knowledge base in developing and testing models of improved practice. This study is part of the descriptive phase of the Center's work, a phase that also includes other assessments of state- and district-level policies to encourage elementary school teachers to teach for understanding and thinking as well as comprehensive assessments of curriculum materials and case studies of teachers' instructional practices.

According to the results of an earlier study in the series (Freeman, 1989), California has assumed the lead in the current curriculum reform movement. California's efforts to encourage elementary school teachers to teach for understanding and thinking in mathematics, science, social studies, literature, and the fine arts differ both quantitatively and qualitatively from those in the other 49 states. In quantitative terms, California's curriculum reform initiatives are more comprehensive than those in any other state. These efforts

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[1]Donald J. Freeman, dean in the College of Education at Arizona State University at Tempe, was a senior researcher with the Center for the Learning and Teaching of Elementary Subjects.

are advanced along six different policy fronts--curriculum frameworks, model curriculum guides, handbooks for program planning, statewide testing, state adoptions of textbooks and other instructional materials, and inservice programs. In qualitative terms, California has made the clearest break from policies and practices that have characterized efforts to promote basic skills development. Perhaps most noteworthy, California has elected to describe desired learner outcomes in narrative terms rather than as lists of goals and objectives. This move, coupled with a more comprehensive policy framework, sets California apart from other states like Indiana, New York, and North Carolina that have also made a concerted effort to encourage elementary school teachers to teach for understanding and thinking.

The central purpose of this report is to provide a closer look at California's policy framework for reshaping the elementary school curriculum. What are the various pieces of the framework and how do they fit together? The report will begin with a general overview of California's efforts to encourage elementary school teachers to teach for thinking and understanding, with attention to the historical origins of the state's curriculum reform movement and some of the assumptions about student learning that undergird the various policy initiatives. Part II of the report will then provide a more detailed account of each initiative--curriculum frameworks, handbooks for program planning, curriculum guides, statewide tests, state adoptions of instructional materials, and inservice programs. Part III will examine the consistency, prescriptiveness, and authoritativeness of California's policies and practices. To what extent do the six policy initiatives align with one another? Do these policies provide clear and consistent messages to teachers that will guide their decisions of what to teach, how to teach, and how to assess student

learning? Finally, Part IV will list the documents that were considered in the preparation of this report.

Limitations

An important caveat to note from the outset is that the focus of this report is limited to a description of policies and practices that were introduced during the first five years of the state's curriculum reform movement--1983 to 1988. The report will not consider curriculum-related initiatives that were introduced later than 1988. The focus of the report is further restricted to an analysis of state-level policies to encourage elementary school teachers to teach for understanding and thinking in the six subject areas listed above. Policies directed toward other goals or other content areas will not be considered. And, most important, no attempt will be made to assess the impact of California's curriculum-reform policies on classroom practice. Although this issue will be addressed in related studies, the analysis in this report will focus solely on the state's intended curriculum and will not consider the curriculum as it is actually enacted in elementary school classrooms.

Data Base

The data base for this report was derived from two major sources--interviews of State Department of Education personnel and a collection of more than 50 curriculum-related documents. The process began with interviews of (a) five curriculum specialists in the California State Department of Education--science, mathematics, history-social science, English-language arts, and the visual and performing arts--and (b) three individuals who had administrative responsibilities within three major areas of policy activity--statewide tests, state instructional materials adoptions, and state sponsored inservice

programs. The interviews served two primary purposes: (a) to provide an overview of the state's efforts to encourage elementary school teachers to teach for understanding and thinking within a specific subject area or within a major area of policy activity, and (b) to identify documents depicting those policy initiatives. The interview schedules featured both open-ended questions and more structured questions calling for the elaboration of specific features of a given initiative. A primary objective throughout each interview was to identify relevant curriculum-related documents and to request copies of those references. The documents that were considered in the preparation of this report are listed in Part IV. The list begins with general references and then cites documents for each major area of policy activity--curriculum frameworks, handbooks, curriculum guides, statewide testing, instructional materials adoption, and inservice programs.

Overview of California's Policy Framework

California's press to encourage elementary school teachers to teach for thinking and understanding was formally launched by the legislature's passage of the Hughes-Hart Educational Reform Act (Senate Bill 813) in 1983. This act established high school graduation requirements and required the newly elected State Superintendent of Public Instruction, Bill Honig, to develop model curriculum standards for California's public high schools. The emphasis on higher order thinking in elementary schools was an extension of that charge.

Working in collaboration with the State Board of Education and the State Curriculum Commission, committees appointed by Superintendent Honig began the task of updating or revising curriculum frameworks in each subject area to reflect a concern for conceptual understanding and higher order thinking from kindergarten through Grade 12. In accord with a seven-year cycle plan for

curriculum review, one framework served as the focus of attention each year. Since 1983, revised frameworks for science (1984), mathematics (1985), English-language arts (1987), history-social science (1988), foreign languages (1988), and visual and performing arts (1982) have been approved by the State Board of Education. An updated framework in health is scheduled to be released in 1991. This set of seven curriculum frameworks serves as the backbone of California's press to teach for conceptual understanding and thinking.

California's curriculum frameworks describe the philosophy and nature of programs in each content area and guide efforts to reshape the elementary school curriculum in five other policy arenas: (a) curriculum guides for teachers, (b) handbooks for program planning, (c) statewide tests, (d) instructional materials adoptions, and (e) inservice and teacher training programs. The framework in mathematics, for example, outlines the content and structure of the mathematics program, the delivery of instruction in mathematics, and the standards for mathematics textbooks and instructional materials. The conceptual orientation of the framework is highlighted in its introduction:

> The inherent beauty and fascination of mathematics commend it as a subject that can be appreciated and enjoyed by all learners. The study of mathematics helps students to develop thinking skills, order their thoughts, develop logical arguments, and make valid inferences. . . . Mathematical power which involves the ability to discern mathematical relationships, reason logically, and use mathematical techniques effectively, must be the central concern of mathematics education and must be the context in which skills are developed. (Mathematics Curriculum Framework and Criteria Committee, 1985, p. 1)

The English-language arts framework is a literature-based program, emphasizing reading comprehension and calling for teachers to provide opportunities for pupils to listen to, read, discuss, and write about good literature. The new framework in history-social science emphasizes history and geography

integrated with the social sciences and humanities as the core of the social studies curriculum (Alexander & Crabtree, 1988). It also encourages teachers to teach content in greater depth and to use literature to enrich the study of history. A revised framework in science will be approved in 1989 and will emphasize themes that provide an organizational framework for key concepts, scientific attitudes, ethical concerns, and process skills (e.g., inferring, predicting). Like recent work of the National Science Teachers Association and the American Association for the Advancement of Science, the revised framework will also emphasize an integrated approach to the conceptual learning of science. The 1982 framework for the visual and performing arts will be reprinted in 1989. This action will continue the state's emphasis on teaching the arts from a problem-solving and conceptual understanding perspective, a perspective that is compatible with the discipline-based approach to art education advanced by the Getty Center for Education in the Arts and the National Art Education Association. The health framework is the final document in the set of frameworks published after Senate Bill 813 was passed in 1983. The health framework committee will begin its deliberations in 1990.

California's model curriculum guides for kindergarten through Grade 8 translate the frameworks into guidelines for elementary and middle school teachers. The guides describe desired topical coverage at each of three grade ranges (Grades K-3, 3-6, and 6-8) and provide specific examples of the kinds of lessons teachers can use to engage pupils in higher order thinking. To date, model curriculum guides have been prepared for elementary and middle school teachers in Mathematics (1987), Science (1987), and English-Language Arts (1988). Comparable guides for history-social science, visual and performing arts, physical education, and foreign languages are currently being developed.

Handbooks for planning effective instructional programs for kindergarten through Grade 12 have been prepared in Mathematics (1982, prior to the "reforms"), Foreign Languages (1985), Physical Education (1986), Writing (1986), and Literature (1988). The primary purpose of each document in this series is to provide a framework for reviewing a district's curriculum in the relevant content area. Toward that end, each handbook includes a checklist for assessing the quality of a school's program and a comprehensive statement of the rationale for each entry on the checklist.

The curriculum guidelines described in the frameworks, model curriculum guides, and handbooks are backed by the California Assessment Program (CAP). The program currently includes tests of reading, mathematics, and writing in Grades 3, 6, 8, and 12 and tests of history and science in Grade 8. CAP results are reported for each school, but not for individual students. The 8th-grade tests were added to the CAP program in 1984 through 1986 and align with the revised frameworks stressing higher order thinking. Since then, the 12th-grade tests of reading, math, and writing have also been revised and direct assessments of students' writing have been added to the 8th- and 12th-grade tests. Prior to these developments, all tests in the California Assessment Program emphasized basic knowledge and skills. The 3rd- and 6th-grade tests still do. Efforts are, therefore, underway to revise these and all of the other CAP tests to align more closely with the new frameworks. Efforts are also underway to add 6th- and 12th-grade tests of history and science, a 6th-grade writing assessment, and a 10th-grade test. The new tests will feature integrated reading and writing assessment, some open-ended questions and performance tests in mathematics, and open-ended questions, essays, and performance tasks in history and science. In science, students will be asked to

write about situations or problems (e.g., describe an experiment), talk about what they have done, and participate in group problem-solving activities.

The most widely publicized initiative in California's policy framework is the textbook adoption plan. Formal reviews of instructional materials in California are guided by standards that are spelled out in each curriculum framework. In mathematics, 28 standards describe the ways in which textbooks and supplementary materials for kindergarten through Grade 8 are expected to align with the mathematics curriculum outlined in the framework; for example, "Lessons for every student, below as well as above average, include the major concepts and skills of every strand. No student is excluded from studying some areas because of difficulty with other areas" (Mathematics Curriculum Framework and Criteria Committee, 1985, p. 20). In 1985, California refused to adopt science textbooks that ignored theories of evolution or overlooked important ethical concerns. In 1986, all of the proposed K-8 series in mathematics were initially rejected because they failed to address the math framework adequately. According to the state's director of mathematics education, these rejections led publishers to replace or substantially rewrite about 10% of the material in the six mathematics series that were ultimately approved. Most recently, the State Board of Education reinforced the emphasis on "real" literature in the English-language arts framework by refusing to adopt textbook series that use literature as window dressing while focusing on isolated skill development.

As the final piece in the puzzle, California sponsors a number of professional development activities that center on the curriculum frameworks and guides. During the year in which a new framework is released, for example, the State Department of Education sponsors regional conferences throughout the state to increase teachers' and administrators' awareness of the new framework.

During the next two years, the State Department provides technical assistance and other forms of support for district-level curriculum development activities focusing on the subject area addressed by the framework. During this period, the State Department also sponsors two-day invitational conferences to help curriculum leaders from throughout the state implement the new framework in their local districts. This goal is also addressed in the California School Leadership Academy Program for school administrators.

Collectively, the products of these six policy initiatives--curriculum frameworks, curriculum guides, handbooks, statewide tests, textbook adoptions, and staff development programs--communicate a consistent message to elementary school teachers calling for increased emphasis on teaching for understanding and thinking. Because California is a local control state, this message takes the form of an appeal and not a mandate. And, because of the scope and magnitude of the task, the effort is viewed as a long-range, 15- to 20-year commitment and not as a short-term endeavor.

Legislative Origins of Curriculum Reform in California

Because California is a local control state, it is important to consider the historical origins of the state's involvement in curriculum-related policy activities. This involvement was initially triggered by Article IX, Section 7.5 of the Constitution of the State of California which reads,

> The State Board of Education shall adopt textbooks for use in grades one through eight throughout the state, to be furnished without cost as provided by statute. (Office of Curriculum Framework and Textbook Development, 1988, p. 37)

Nevertheless, as the following section of the Education Code clearly states, ultimate authority for the selection of instructional materials is vested in local school districts.

> 60002. The Legislature hereby recognizes that, because of the common needs and interests of the citizens of this state and nation, there is a need to establish broad minimum standards and general educational guidelines for the selection of instructional materials for the public schools, but that, because of economic, geographic, physical, political, educational, and social diversity, specific choices about instructional materials need to be made at the local level. (Office of Curriculum Framework and Textbook Development, 1988, p. 37)

Senate Bill 1 (Chapter 182) passed by the California Legislature in 1968 opened the door for the development of state-level curriculum frameworks. It acknowledged the authority of local districts, yet recognized the need to establish some level of uniformity in the curriculum across the state. A significant product of that legislation was the addition of the following Section to the Education Code:

> 51002. The Legislature hereby recognizes that, because of the common needs and interests of the citizens of this state and the nation, there is a need to establish a common state curriculum for the public schools, but that because of economic, geographic, physical, political, and social diversity, there is a need for the development of educational programs at the local level, with the guidance of competent and experienced educators and citizens. Therefore, it is the intent of the Legislature to set broad minimum standards and guidelines for educational programs, and to encourage local districts to develop programs that will best fit the needs and interests of the pupils, pursuant to stated philosophy, goals, and objectives. (California State Department of Education, 1977, p. 1)

Legal authority for the state's development of curriculum frameworks was reinforced by Assembly Bill 531, passed by the Legislature in 1972. This bill (a) defined curriculum frameworks as "an outline of the components of a given course of study designed to provide state direction to school districts in the provision of instructional programs," and (b) specified that the Curriculum Development and Supplemental Materials Commission would recommend curriculum frameworks to the state board (California State Department of Education, 1977, p. 1).

As noted earlier, the current curriculum reform movement in California was formally launched by the Legislature's passage of the Hughes-Hart Educational

Reform Act of 1983 (Senate Bill 813). The primary intent of this widesweeping legislation was to improve the quality of instruction in California's secondary schools. Nevertheless, three of its provisions also had important implications for elementary schools:

1. The Act called for the Superintendent of Public Instruction to establish 15 or more Teacher Education and Computer (TEC) Centers throughout the state, "to provide staff development resources to teachers, administrators, other school personnel, and other persons providing services to schools" (State of California, p. 63). As will be described in a later section of this report, prior to their termination in 1987, the TEC centers played a significant role in the state's professional development initiatives.

2. Section 60603 (c) of the Education Code was amended to read: "The State Board of Education shall develop a testing method that will obtain an accurate estimate of statewide performance, school district performance, and school performance of pupils in grades 3, 6, 8, 10, and 12, in basic skills courses and content courses" (State of California, p. 132). Prior to this Act, existing law focused on basic skills courses only and called for tests in only two grades--6 and 12.

3. Perhaps most noteworthy, Senate Bill 813 reinstated statewide high school graduation requirements and called for the development of model curriculum standards to insure that the mandated courses would be of high quality.

Beginning with the 1986-87 school year, all students seeking a diploma of graduation from a California high school were required to complete a minimum of

- three courses in English
- three courses in history-social science
- two mathematics courses
- two science courses
- one course in fine arts or foreign language, and
- two courses in physical education (unless exempted).

Moreover, the legislation required the Superintendent of Public Instruction to develop (and the State Board of Education to adopt) model curriculum standards for the mandated course requirements listed above and called for local school districts to compare their curricula to these standards at least once every three years. Section 51226 which was added to the Education Code reads as follows:

> 51226 (a) The Superintendent of Public Instruction shall coordinate the development, on a cyclical basis, of model curriculum standards for the course of study required by Section 51225.3. The superintendent shall set forth these standards in terms of a wide range of specific competencies, including higher level skills, in each academic subject area . . . (b) Not less than every three years, the governing board of each school district shall compare local curriculum, course content, and course sequence with the standards adopted pursuant to subdivision (a). (State of California, p. 118-119)

The significance of this Act for elementary schools rests primarily in a subsequent decision by the State Department of Education to voluntarily extend the concept of curriculum standards to elementary and middle schools. This decision resulted in the ongoing development of a set of documents called Model Curriculum Guides for Kindergarten Through Grade Eight. By the close of 1988, Curriculum Guides had been prepared for science, mathematics, and English-language arts.

The Coordination of Curriculum Reform in California

Implementation of the curriculum reforms outlined in Senate Bill 813 is driven by a coherent, long-range plan that is backed by strong leadership from the State Superintendent of Public Instruction.

Superintendent Honig's Role

A quotation attributed to Superintendent Bill Honig that appears in the preface to the Handbook for Planning an Effective Writing Program (Handbook Writing Committee, 1986) reads, "We will shift the emphasis in the Department from bureaucratic processes, such as the reading of plans, to the provision of substantive assistance in curriculum and instruction" (p. viii). According to the curriculum specialists we interviewed, Honig has done just that. One interviewee voluntarily noted that Superintendent Honig was personally involved in the development of the curriculum framework in his subject area. Another volunteered that Honig allocated the strongest resources in the State

Department to assist in the design and development of the framework in his content area. Another credited Honig with the decision to extend the curriculum standards concept to the elementary and middle school levels through the development of K-8 curriculum guides. And, a fourth interviewee credited Honig with the origin of the press for literature in the state's curriculum and the move to extend the California Assessment Program beyond paper-and-pencil tests. Simply stated, it is evident from these unsolicited comments that Superintendent Honig has played an active and significant role in the design and coordination of California's curriculum reform initiatives.

The Seven-Year Cycle Plan

A second factor that has contributed to the overall coordination of California's efforts to encourage elementary school teachers to teach for understanding and thinking is a predetermined seven-year cycle (initially six-years) for curriculum framework development and state-level adoption of instructional materials. According to the authors of a state board publication describing the policies and procedures for framework adoptions (Office of Curriculum Framework and Textbook Development, 1988), "the cycle promotes the philosophy of regular curriculum evaluation and revision" (p. 1). The seven-year cycle dictates both the years in which each framework will be revised and the dates on which instructional materials will be submitted for state adoption. The cycle also establishes the calendar for some of the state's staff development activities and the intended dates on which district reviews of instructional programs within specific subject areas will occur. Table 1 was prepared by the Office of Curriculum Framework and Textbook Development Within the California State Department of Education (1988) and portrays the seven-year cycle for the years 1987-1994.

The critical dates in the seven-year cycle are the publication of an updated curriculum framework in a specific subject area and state- and district-level adoptions of instructional materials in that subject area which follow about three years later. According to the Director of the Office of Curriculum Framework and Textbook Development, this three-year period between framework approval and state textbook adoption provides time for

1. publishers to prepare textbooks and/or instructional materials that address the framework.
2. districts to conduct staff development programs focusing on implementation of the frameworks.
3. staff in the California Assessment Program to make revisions in the CAP tests.
4. teacher preparation institutions to prepare teachers who know how to apply the framework guidelines.

This time frame also determines the dates on which the State Department will (a) launch inservice campaigns aimed at increasing teachers' and administrators' awareness of a new framework, and (b) sponsor invitational conferences aimed at upgrading local curriculum leaders' skills in implementing the framework. Finally, the three year span between the publication of a new framework and state adoptions of instructional materials is also the time in which local districts are encouraged to conduct systematic reviews of the instructional programs they offer in the subject area covered by the revised framework (with technical assistance from the State Department).

Major Tenets and Assumptions Undergirding California's Efforts to Encourage Teaching for Understanding and Thinking

Among the many tenets and assumptions that characterize California's curriculum reform initiatives, four stand out as particularly salient. They are

1. The state's emphasis on teaching for thinking and understanding is not compromised by a countervailing emphasis on mastery of basic skills.

Table 1

Schedule for Curriculum Framework Development and Adoption of Instructional Materials

	1987	1988	1989	1990	1991	1992	1993	1994
English - Language Arts		(A)	<>		[F]----------[F]			
Visual/Perf. Arts Bilingual/ Bicultural *			(A)	<>		[F]----------[F]		
History - Social Science	-------[F]			(A)	<>		[F]----------[F]	
ESL/ Foreign Language	[F]---------- [F]				(A)	<>		[F-------
Science		[F]----------[F]				(A)	<>	
Mathematics			[F]----------[F]				(A)	<>
Health				[F]----------[F]				(A)

[F] FRAMEWORK

* After 1989, Bilingual/Bicultural materials will be adopted as part of each subject area adoption.

(A) STATE ADOPTION OF INSTRUCTIONAL MTRLS
Instructional Mtrls Evaluation: Apr-Jun
Curriculum Comm. recommendations: Jul-Aug
State Board Adoption: Sep-Oct

<> Newly adopted materials available for order by districts March 1

Reproduced from, "Instructional Materials and Framework Adoption: Policies and Procedures" (California State Department of Education, 1988).

2. The press for understanding and thinking is directed toward all students.

3. There is a growing call for subject matter integration across the curriculum.

4. The state's curriculum initiatives are guidelines, not mandates for local districts or teachers.

Relative Strength of Press for Higher Level Outcomes

California was one of only nine states in the 50-state survey that described their emphasis on higher order thinking as stronger than their emphasis on mastery of basic skills (see Freeman, 1989). This unequivocal commitment to teaching for understanding and thinking is perhaps best illustrated in the Mathematics Model Curriculum Guide, Kindergarten Through Grade Eight (Mathematics Curriculum Guide Advisory Committee, 1987). The authors state in boldface print that, "the fundamental premise on which this document is based is that every aspect of mathematics that students study should enhance their understanding of mathematical ideas and promote the growth of thinking" (p. 12). The authors of the mathematics guide also challenge the commonly held belief that learning must proceed in a linear sequence from lower level to higher level outcomes. (Those who hold this belief are likely to argue that mastery of basic skills must occur before higher level learning is possible.) Describing what they mean by the concept of "essential understandings," the authors assert that,

> they are not a set of basic ideas which "come first" followed by more advanced concepts. These essential understandings bind together rather than precede those specific concepts and skills which have traditionally been taught. . . . An important characteristic of the essential understandings is that they can be encountered at many different levels of complexity and abstraction. Therefore, they can be experienced in some way at all grade levels. (Mathematics Curriculum Guide, Advisory Committee, 1987, p.15)

The prefaces to all three of the Model Curriculum Guides--mathematics, science, and English-language arts--advance the same position:

> The overarching message of the "Guides" is that learning is not linear. It is a process that involves the continuous overlay of concepts and skills so that students' understandings are ever-broadened and ever-deepened. The content and model lessons of the Guides are structured to help teachers lead discussions, frame questions, and design activities that contain multiple levels of learning. . . .
>
> The shift of emphasis from mastering basic skills to understanding thoroughly the content of the curriculum is intentional. (e.g., Science Curriculum Guide Advisory Committee, 1987, p. vii)

Higher Level Outcomes for All Learners

Various curriculum-related documents also make clear statements about the range of students for whom the guidelines are intended. For example, one of the criteria for evaluating physical education programs presented in the Handbook for Physical Education (1986) reads, "All students (exceptional, poorly skilled, average skilled, and highly skilled) are provided equal opportunities to reach their potential" (p. 3). Likewise, a central feature of the English-Language Arts Framework (1987) is its call for "a literature-based program that encourages reading and exposes all students, including those whose primary language is not English, to significant literary works" (p. 3). The Mathematics Framework (1985) states, "The goal is for all students to be able to use mathematics with confidence; therefore, every student must be instructed in the fundamental concepts of each strand of mathematics, and no student should be limited to the computational aspects of the number strand" (p. 2). The authors of the Science Framework Addendum (1984) cast this expectation in the following terms,

> The position taken here is that all students should be given opportunities to develop formal thinking capabilities in science along the lines proposed in the model. While the expectations may turn out to be unrealistic for some students, there will be others who will

> achieve at higher levels than they might have if the challenge had not been provided. (Science Curriculum Framework and Criteria Committee, 1984, p.7)

A State Department publication entitled Program Quality Review for High Schools: Process, Criteria, and Self-Study (Office of School Improvement, California State Department of Education, 1987) provides the most comprehensive statement of the "equal access" premise.

> There is a common core of knowledge that all educated citizens should possess. By opening vistas for students into the broad achievements and issues of civilization, this core will empower the students to participate in and benefit from a higher quality life. This core includes cultural literacy, scientific literacy, knowledge of the humanities, and appreciation of the values that undergird our society. In addition, through this core curriculum, students should develop fully the skills of reading, writing, speaking, listening, calculating, and learn the ability to think critically. All students should have access to the core curriculum. Most students are expected to succeed in this rigorous academic curriculum [emphasis added]. (p. 25)

Subject-Matter Integration

Another characteristic theme in the curriculum proposals in California is the call for subject-matter integration across the curriculum. According to the Director of the Office of Curriculum Framework and Textbook Development, this theme is becoming increasingly prominent with each new framework. A clear example is the repetition of the emphasis on good literature throughout the curriculum. The English-Language Arts Framework (1987) calls for a literature-based curriculum with abundant opportunities for pupils to listen to, talk about, read, and write about good literature. The History-Social Science Framework (1988) extends this call to the study of history.

> This framework emphasizes the importance of enriching the study of history with the use of literature, both literature of the period and literature about the period. Teachers of history and teachers of language arts must collaborate to select representative works. Poetry, novels, plays, essays, documents, inaugural addresses, myths,

> legends, tall tales, biographies, and religious literature help to shed light on the life and times of the people. (History-Social Science Curriculum Framework and Criteria Committee, 1988, p. 4)

The Science Model Curriculum Guide (1987) extends the "good literature" theme to science. It even provides a list of scientific literature that is appropriate for elementary and middle school youngsters. The Guide also sounds a more general call for integration of subjects.

> The reader will note throughout the Science Model Curriculum Guide numerous references to learning activities that can be integrated with the visual and performing arts, English-language arts, mathematics, and history-social science. The appendices at the end further elaborate on the resources and materials that can be used to integrate science with other areas. (Science Curriculum Guide Advisory Committee, 1987, p. 1)

Even the Handbook for Physical Education (Physical Education Handbook Committee, 1986) reinforces the subject-matter integration theme. According to the authors, one of the "seven areas that must be addressed to achieve the goals of a physical education program. . . [is]. . . humanities--the study of social history depicted in play, sports, and dance" (p. 4).

Local Control and Long-Range Planning

California's curriculum reform proposals reflect its status as a local control state. The expectation is that local districts and schools will assume primary responsibility for curriculum development, with the state initiatives serving as aids or guides for local efforts. As cited earlier, Senate Bill 1 passed by the California Legislature in 1968 provides a clear statement of this expectation. A comparable statement appears in the preface to each of the Model Curriculum Guides.

> Although the Guides are not mandatory, they are intended as evocative models of curriculum content. Individual schools will probably modify, and expand the content as appropriate, for their particular student populations. (e.g., Science Curriculum Guide Advisory Committee, 1987, p. vii)

The Model Curriculum Guide for English-Language Arts (English-Language Arts Curriculum Guide Advisory Committee, 1988) elaborates on this statement in the following way:

> The committee expects, then, that readers will look at this guide as a model with which they might compare existing programs. The committee also expects that the guide will serve as a motivator for educators to develop a more extensive array of locally appropriate representative enabling activities, which then becomes the backbone of a new local program. (p. 4)

Finally, the Science Framework Addendum (Science Curriculum Framework and Criteria Committee, 1984) provides another clear example of a direct appeal to local districts. It notes that the Addendum has made no attempt to list specific learning activities that can be used to teach the concepts, processes, and skills that serve as the central focus of the Addendum and then adds,

> The task of identifying learning activities, along with the tasks of determining sequence and selecting instructional materials and instruments for evaluating learner achievement, will need to be addressed in the process of curriculum development at the local level. (p. 6)

California's curriculum reform initiatives are part of a long-range plan for reshaping the curriculum. According to one of the curriculum specialists we interviewed, the expectation is that it will take at least 15 years to persuade a critical mass of teachers to make a clear commitment to teaching for understanding and thinking. In other words, curriculum planners in California do not expect each new element in the curriculum reform plan to have an immediate and widesweeping impact on practice. But, they do expect to make slow and steady progress toward the ideals portrayed in each initiative over time.

II. A CLOSER LOOK AT THE SIX POLICY INITIATIVES THAT ARE EMPHASIZED

California's efforts to persuade elementary school teachers to teach for understanding and thinking are advanced across six policy fronts: (a) curriculum frameworks depicting the conceptual foundations for K-12 programs in seven

subject areas--health, the visual and performing arts, science, mathematics, English-language arts, history-social science, and foreign languages, (b) handbooks for curriculum planning covering five subjects areas--mathematics, foreign languages, physical education, writing, and literature, (c) curriculum guides for K-8 teachers in three subjects--science, mathematics, and English-language arts, (d) state adoptions of instructional materials that address the curriculum frameworks, (e) statewide tests in reading, writing, mathematics, science, and history-social science, and (f) inservice activities and publications supporting teachers' and administrators' implementation of the frameworks. This section of the report will consider each of these initiatives in more detail.

The Role of Curriculum Frameworks

As noted in the introduction, state-level curriculum frameworks are the backbone of California's curriculum reform efforts. Covering seven different subject areas, frameworks

> describe the core curriculum and provide direction for effectively transmitting the skills, knowledge, and understandings to all students. They reflect research in both content and structure of the core curriculum and the pedagogy to deliver it. (Office of Curriculum Framework and Textbook Development, 1988, p. 4)

In other words, frameworks provide the conceptual foundation for all of the other policy initiatives--handbooks and curriculum guides, statewide tests, state adoptions of instructional materials, and staff development. This section of the report will provide an overview of (a) the variety of purposes that the curriculum frameworks are intended to serve, (b) the process by which frameworks are revised, and (c) the essential elements and expectations for student learning portrayed in four frameworks that were revised during the five-year time frame for this report--1983 through 1988.

Multiple Purposes

The various purposes that frameworks are intended to serve are spelled out in a document published in 1988 by the California State Department of Education entitled, Instructional Materials and Framework Adoption: Policies and Procedures. In the authors' words, "frameworks and accompanying criteria are used to evaluate and adopt instructional materials, to provide direction for staff development, and serve as the basis for the development and revision of the state's testing program" (p. 4). Other purposes outlined in the document include

1. to establish guidelines and provide direction for district curriculum reviews and revisions.
2. to provide the basis for the education of teachers and administrators.
3. to furnish guidance to individuals responsible for developing the curriculum for the public schools who are at the state, county, and local levels.
4. to provide information on the curriculum to parents and the general public.
5. to provide guidelines for school districts to use in selecting instructional materials for Grades 9 through 12.

An earlier State Department of Education publication entitled, California Curriculum Frameworks: A Handbook for Production, Implementation, and Evaluation Activities (1977) also noted that the frameworks play an important role in maintaining the continuity of instruction from district to district and from kindergarten through Grade 12. However, this purpose is not restated in the more recent publication.

The Framework Revision Process

An advisory body to the State Board of Education known as the Curriculum Development and Supplemental Materials Commission (Curriculum Commission) is

responsible for developing frameworks and submitting them to the State Board for adoption. The Commission is, in turn, organized into Subject Matter Committees (SMCs) that are responsible for overseeing the development of frameworks in specific subject areas.

The timing and order in which frameworks are revised are determined by the seven-year cycle established by the State Board of Education and described in the introduction (see Table 1). The framework development process begins with the formation of a Curriculum Framework and Criteria Committee which is responsible for writing the new framework. According to stated policies and procedures, each framework committee consists of a minimum of 9 to a maximum of 15 members who are selected by the Subject Matter Committee, appointed by the Curriculum Commission, and approved by the State Board of Education (Office of Curriculum Framework and Textbook Development, 1988). In practice, however, the number of individuals who play an active role in committee deliberations is typically greater than 15. Consultants from the State Department of Education, members of the Curriculum Commission's Subject Area Committee, and other individuals with subject area expertise are also likely to participate in the process. According to the Director of Mathematics Education, the State Department consultants usually play a prominent role (even though they are not formal members of the committee), making substantive contributions to the committee's deliberations as well as lending logistical support. Policy guidelines insure that formal membership on the committee represents a variety of professional interest groups (e.g., classroom teachers, local school districts, county offices, colleges and universities, and citizen groups). According to one of the Curriculum Specialists we interviewed, about two-thirds of the members are typically employed by school districts--mostly teachers and curriculum specialists.

The task of updating the framework usually takes about 1-1/2 to 2 years. During this period, the framework and criteria committee meets several times in both full committee and subcommittee sessions. Although all members may play an active role in drafting the framework, a smaller subset of committee members usually assumes major responsibility for the writing. One or more of the preliminary drafts are also subjected to an external field review involving a representative sample of teachers, district and county personnel, and public citizens from throughout the state and nation. For example, more than 1,000 copies of the draft version of the History-Social Science Framework were sent out to local educators as part of this field review process. The final draft of the framework and criteria for selection of instructional materials is submitted for approval to the Curriculum Commission. The Commission then forwards the document to the State Board of Education for approval.

Once adopted by the Board, the framework is published by the State Department of Education and circulated to districts, schools, and teachers throughout the state. During this dissemination phase, one copy of the framework is sent to each school. As soon as the framework is approved, the Curriculum Commission, with the assistance of the State Department, also hosts a framework orientation meeting for all publishers to facilitate their understanding of the framework. The major components of the framework development process are detailed in the flow chart on the following page (see Figure 1). This chart is taken from a State Department of Education publication entitled, Instructional Materials and Framework Adoption: Policies and Procedures (1988).

General Overview of Four Frameworks

Three new frameworks were approved during the five-year time frame for this report--Mathematics (1985), English-Language Arts (1987), and History-Social Science (1988). A Science Addendum was also released in 1984. Revised frameworks in foreign languages and science are scheduled to be approved in 1989. As noted in the introduction, the science framework will emphasize scientific attitudes and ethical concerns as well as key concepts and scientific thinking processes (e.g., inferring). The visual and performing arts framework will also be reprinted in 1989 and will continue to promote teaching the arts from a problem-solving and conceptual understanding perspective. A revised version of the health framework will be published in 1991, thereby completing the first seven-year cycle following the passage of Senate Bill 813. This subsection of the report will take a brief look at the four frameworks that were published from 1983 through 1988 and will consider similarities and differences in the ways these documents consider the following general areas of concern: (a) goals and essential elements, (b) expectations for student learning, (c) guidelines for instruction, (d) guidelines for assessing student learning, and (e) criteria for evaluating instructional materials.

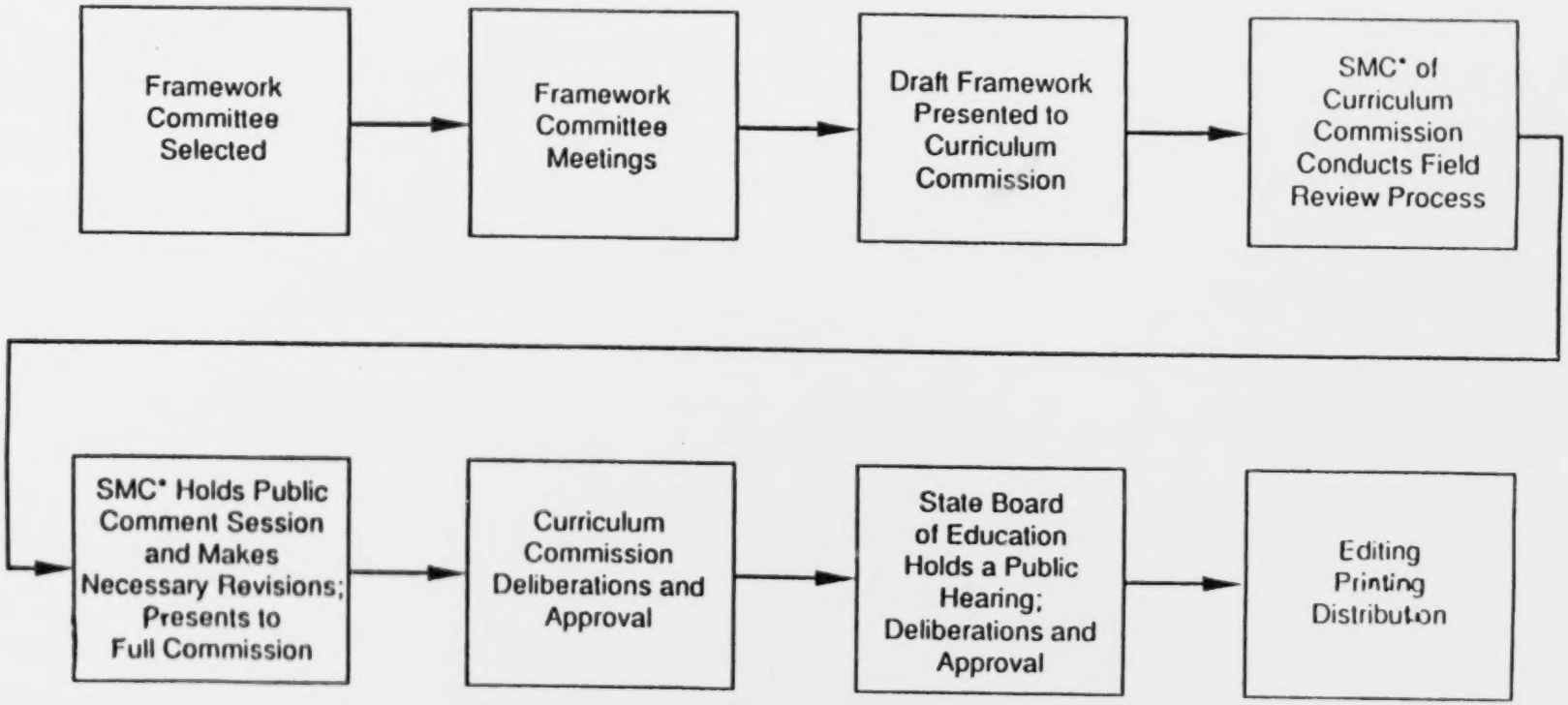
Goals and Essential Elements

Goals and essential elements of the four programs of instruction--science, mathematics, English-language arts, and history-social science--are spelled out in the introductory sections of each framework. As illustrated in the following brief sketches, teaching for understanding and thinking are emphasized in each framework. Each introduction also asserts that this more balanced program of instruction is intended for all students.

Figure 1

CURRICULUM FRAMEWORK DEVELOPMENT AND APPROVAL PROCESS

Time Involved: Approximately 18 Months from First Meeting to State Board Approval


Framework Committee Selected
Framework Committee Meetings
Draft Framework Presented to Curriculum Commission
SMC* of Curriculum Commission Conducts Field Review Process
SMC* Holds Public Comment Session and Makes Necessary Revisions; Presents to Full Commission
Curriculum Commission Deliberations and Approval
State Board of Education Holds a Public Hearing; Deliberations and Approval
Editing Printing Distribution

Reproduced from "Instructional Materials and Framework Adoption: Policies and Procedures" (California State Department of Education, 1988).

*Subject Matter Committee

Science. The recent revision of the science framework is titled, Science Framework Addendum for California Public Schools, Kindergarten Through Grade Twelve. It "is an extension of the 1978 'Science Framework for California Public Schools' and is intended to be used in conjunction with the framework" (Science Curriculum Framework and Criteria Committee, 1984, p. vi). The introduction to the addendum outlines four major goals of the science program that call for attention to scientific attitudes and ethical concerns as well as major concepts, processes, and skills. According to the authors,

> certain science concepts and skills are basic to scientific literacy--to a rational understanding of ourselves and our surroundings--and these concepts and skills need to be addressed appropriately at several developmental levels. It is also vital that the development of attitudes and values, rational thinking processes, and manipulative and communicative skills should take place in close association with the development of these concepts. . . . The position taken here is that all students should be given opportunities to develop formal thinking capabilities in science along the lines proposed in the model. (Science Curriculum Framework and Criteria Committee, 1984, pp. 1 & 7)

Mathematics. The conceptual orientation of the mathematics framework is also outlined in its introduction.

> The inherent beauty and fascination of mathematics commend it as a subject that can be appreciated and enjoyed by all learners. The study of mathematics helps students develop thinking skills, order their thoughts, develop logical arguments, and make valid inferences. . . . Mathematical power which involves the ability to discern mathematical relationships, reason logically, and use mathematical techniques effectively, must be the central concern of mathematics education and must be the context in which skills are developed. . . .
>
> The goal is for all students to be able to use mathematics with confidence; therefore, every student must be instructed in the fundamental concepts of each strand of mathematics, and no student should be limited to the computational aspects of the number strand.
>
> New concepts should be presented in such a way that all students can grasp the basic ideas. From a point of common understanding, the

> concepts and their interrelationships should be developed in increasing depth. (Mathematics Curriculum Framework and Criteria Committee, 1985, pp. 1-2)

English-language arts. The essential features of the English-language arts curriculum outlined in the framework call for: "a 'literature-based' program that encourages reading and exposes all students, including those whose primary language is not English, to significant literary works . . . instructional programs that emphasize the integration of listening, speaking, reading, and writing and the teaching of language skills in meaningful contexts [and] instructional programs that guide all students through a range of thinking processes as they study content and focus on aesthetic, ethical, and cultural issues" (English-Language Arts Curriculum Framework and Criteria Committee, 1987, p. 3). In the words of the framework's authors,

> The structuring of an English-language arts program around matters so intensely personal and human as expression and language cannot be limited to a daily list of ten or 15 skill objectives or to the completion of meaningless work sheets, sometimes called the dismal paperchase of childhood. Reading activities, rather than focusing only on identifying words, must help students become fluent in language as they expand their understanding of a text. Writing activities, rather than focusing on legibility or mechanics in isolation, must enable students to plan strategies for communicating their thoughts effectively according to their audience and purpose.
>
> Speaking and listening activities, rather than presuming that students are, in the words of Charles Dickens' Mr. Gradgrind, pitchers "to be filled so full of facts," must involve students actively as they describe their encounters with literature and composition and interactively as they communicate their understandings and insights to others. (English-Language Arts Curriculum Framework and Criteria Committee, 1987, p. 2)

History-social science. The History-Social Science Framework stresses the study of history and geography, integrated with the social science disciplines and the humanities. In the words of the authors, this knowledge is "essential in developing individual and social intelligence; preparing students for responsible citizenship; comprehending global interrelationships; and

understanding the vital connections among past, present, and future" (History-Social Science Curriculum Framework and Criteria Committee, 1988, p. 3).

The framework lists 17 "distinguishing characteristics" of the history-social science curriculum which include the following:

- Is centered in the chronological study of history . . .
- Emphasizes the importance of enriching the study of history with the use of literature, both literature of the period and literature about the period . . .
- Emphasizes the importance of studying major historical events and periods in depth as opposed to superficial skimming of enormous amounts of material . . .
- Encourages the development of civic and democratic values as an integral element of good citizenship . . .
- Encourages teachers to present controversial issues honestly and accurately within their historical or contemporary context . . .
- Proposes that critical thinking skills be included at every grade level. (History-Social Science Curriculum Framework and Criteria Committee, 1988, pp. 4-7)

Expectations for Student Learning

The four frameworks vary significantly in style, focus, and organization. In the Science Addendum, for example, expectations for student learning are listed for upper and lower elementary grade levels across several different content domains and no attempt is made to describe instructional strategies. In sharp contrast, the History-Social Science Framework provides relatively detailed narrative descriptions of units of instruction that should be presented at each grade level. The narratives portray both what should be taught and how it should be taught, but make no attempt to disentangle one from the other. The English-Language Arts Framework also relies on a narrative style that does not distinguish the whats from the hows of the curriculum. The Mathematics Framework, on the other hand, does distinguish between content and instruction,

and uses both lists of objectives and narrative descriptions in describing expectations for student learning.

Science. The outcomes section of the Science Addendum is titled, "Expectations for Learners' Achievement in Science--A Model." It describes desired learner outcomes for grades K-3, 3-6, and 6-8 for 18 different content areas: (a) six areas of biological science (e.g., plants), (b) four areas of earth science (e.g., astronomy), (c) seven areas of physical science (e.g., matter), and (d) a general category entitled, "Science, Technology, Individuals and Society." Student expectations are presented for each of the 18 content areas and four grade ranges (K-3, 3-6, 6-8, and 9-12) in two parallel lists. Science concepts, technological applications, and ethical concerns are listed in the first of two columns, with processes and skills presented in the second column (juxtaposed with specific concepts). The following example illustrates this format and the types of higher level outcomes that are described:

Content Area: Biological Science--Cells, Genetics, and Evolution

Knowledge: Science Concepts, Technological Applications, and Ethical Concerns	Thinking Processes and Manipulative and Communicative Skills
Grades K-3	
- There is great diversity among living things.	- Observe and describe a variety of living things, noting similarities and differences.
- The many different kinds of living things have characteristics and behaviors by which they can be described, identified, sequenced, and classified.	- Classify animals according to a variety of characteristics (one at a time); e.g., food eaten, body covering, appendages, or habitat.
Grades 3-6	
- Living things have adaptations that enable them to live in their particular habitats.	- Observe and describe characteristics and behaviors of organisms, including humans, that live in different environments; e.g., desert, pond.

(Science Curriculum Framework and Criteria Committee, 1984, pp. 14-15)

Mathematics. In a section labeled, "Content and Structure of the Mathematics Program," the Mathematics Framework lists 61 major mathematics concepts that students are expected to learn at some point during their K-12 years (grade levels are not specified). Concepts are cited for seven different areas or strands of mathematics--number, measurement, geometry, patterns and functions, statistics and probability, logic, and algebra.

Examples of major concepts:

Number: Develop facility with a variety of methods of computation and be able to choose the most efficient and effective method of solving a given problem: mental arithmetic, paper-and-pencil algorithm, estimation, or calculator.

Measurement: Using nonstandard, arbitrary units of measure at first and then standard units, recognizing that standard units are needed for communication and simplified notation. (Mathematics Curriculum Framework and Criteria Committee, 1985, pp. 9-10)

Desired learning outcomes are also described in more detail in later sections headed, "Mathematics Programs: Kindergarten Through Grade Three" and "Mathematics Programs: Grades Three Through Six." These descriptions begin with narrative overviews of desired instructional practices for each of the seven mathematics strands, called "special concerns" and end with more detailed lists of instructional objectives, called "program content."

Examples of special concerns:

Classification (Grades K-3): "All students in primary grades should have many opportunities to carry out varied classifying and sorting activities with one or more attributes. Students should discuss their observations, conjectures, and conclusions, deciding whether they are reasonable and logical."

Problem Solving (Grades 3-6): "Continual emphasis should be placed on development of problem solving skills of formulation, analysis, selection of strategies, solution techniques, and verification and interpretation of solutions. Students at this level should be able to suggest and use several strategies for solving problems, such as guessing and checking,

making a model or drawing, making an organized list, working backwards, or considering a simpler related problem" (Mathematics Curriculum Framework and Criteria Committee, 1985, pp. 23, 25).

Examples of program content:

Number (Grades K-3): "Count by ones, twos, fives, and tens. . . . Demonstrate an understanding of the meaning of the four basic operations."

Number (Grades 3-6): "Interpret problems by using pictures and models and role playing and, when appropriate, translate into mathematical expressions and explain the process."

Statistics and Probability (Grades 3-6): "Predict, perform, and record results of simple probability experiments" (Mathematics Curriculum Framework and Criteria Committee, 1985, pp. 23, 26-27).

English-language arts. The English-Language Arts Framework provides only a general overview of the intended instructional program for the upper and lower elementary grades in a section labeled, "Exemplary Practices." In other words, it is the least prescriptive of the four frameworks in describing what should be taught. The following highlights are taken from the framework's five-paragraph description of the English-language arts program for Grades 3 through 6:

> Beginning sometime between grades three and six, usually around age 10, students become especially interested in the world beyond their immediate environment. As at all levels, understanding meaning remains the greatest motivator for language learning. . . .
>
> Reading activities must be significant and meaningful, integrating all other language arts of listening, speaking, reading, and writing as students build their language skills. At these grade levels the teaching of letter-sound relationships should have been completed. . . .
>
> Whatever the unit of study or activity, students at this level need many opportunities to formulate and share ideas with each other in small-group work and discussion. . . .
>
> Because writing is integral to learning, students in grades three through six should write daily and should be encouraged to rethink, rearrange, and polish words. Practice writing should include some direct teaching of the strategies for good writing during the prewriting, drafting, revising, and editing stages. (English- Language Arts Curriculum Framework and Criteria Committee, 1987, p. 29)

History-social science. The goals of the History-Social Sciences Framework fall into three broad categories, each of which is represented by a series of curriculum strands: (a) knowledge and cultural understanding, represented by six strands (developing historical, ethical, cultural, geographic, economic, and sociopolitical literacy), (b) democratic understanding and civic values, represented by three strands (national identity, constitutional heritage, and civic values, rights, and responsibilities), and (c) skills attainment and social participation, represented by three strands (basic study skills, critical thinking skills, and civic participation skills). Teachers in every grade are "expected to integrate and correlate these strands as part of their teaching of the history-social science curriculum" (History-Social Science Curriculum Framework and Criteria Committee, 1988, pp. 10-12).

Each strand is further subdivided into basic learnings. The essential learnings for ethical literacy, for example, are to "recognize the sanctity of life and dignity of the individual . . . understand the ways in which different societies have tried to resolve ethical issues . . . understand that the ideas people profess affect their behavior, [and] . . . realize that concern for ethics and human rights is universal and represented the aspirations of men and women in every time and place" (History-Social Science Curriculum Framework and Criteria Committee, 1988, p. 14). Critical thinking skills to be developed in the context of the History-Social Science Framework are to "define and clarify problems . . . judge information related to a problem, [and] . . . solve problems and draw conclusions" (p. 25). The framework lists a total of 49 essential learnings (including six categories of basic study skills) across the 12 strands and provides a brief description of each. The description for skills in defining and clarifying problems, for example, reads as follows:

> Included in these skills are the ability to identify central issues or problems, to determine which information is relevant, to make distinctions between verifiable and unverifiable information or between essential and incidental information, and to formulate appropriate questions leading to a deeper and clearer understanding of an issue. (History-Social Science Curriculum Framework and Criteria Committee, 1988, p. 25)

Descriptions of goals and curriculum strands are followed by a long section of the framework, labeled, "Course Descriptions." The titles for K-6 courses are

Kindergarten - Learning and Working Now and Long Ago
Grade One - A Child's Place in Time and Space
Grade Two - People Who Make a Difference
Grade Three - Continuity and Change
Grade Four - California: A Changing State
Grade Five - United States History and Geography: Making a New Nation
Grade Six - World History and Geography: Medieval and Early Modern Times

In contrast to the other frameworks which describe desired outcomes for the upper and lower elementary grade ranges (K-3 and 3-6), the History-Social Science Framework provides relatively detailed narrative descriptions of what should be taught at each grade level. Second grade teachers, for example, are expected to consider three categories of "people who make a difference"--(a) people who supply our needs, (b) our parents, grandparents, and ancestors from long ago, and (c) people from many cultures, now and long ago (pp. 37-40). The ways in which each of these units should be presented are also described.

Guidelines for Instruction

As noted earlier, the styles in which guidelines for instruction are portrayed vary dramatically across the four frameworks. At one end of the continuum, the authors of the Science Addendum make no attempt to describe instructional strategies. In the authors' words:

> The processes and skills juxtaposed with specific concepts in this model are intended to describe what students should be able to do as a result of instruction, not activities that would bring about such learning. In some cases the processes and skills imply classroom activities, but no attempt has been made to list specific learning activities that can be used to teach the concepts, processes, and skills. (Science Curriculum Framework and Criteria Committee, 1984, p. 6)

At the other end of the continuum, all but one of the chapters in the English-Language Arts Framework provide a running account of the ways in which listening, speaking, reading, and writing should be taught, with no clear delineation between what should be taught and how it should be taught. The examples of expectations for student learning presented earlier provide a sense of the narrative format that characterizes this framework. The one chapter that focuses squarely on instruction is entitled, "Effective Instruction in English-Language Arts." The chapter's subtitles outline the topics that are considered. They are

- Modeling of English-Language Arts
- The Art of Questioning
- Direct Teaching of Learning Strategies
- Reading Great Literature
- Developing Composition Skills
- Developing Oral Language Skills
- Teaching the Conventions of Language
- Use of Technology in English-Language Arts
    - Visual and Audio Media
    - Word Processors and Computers
- Multimodal Approaches to Teaching
- Curriculum for Students with Special Needs
    - Less-Prepared Students
    - Gifted Students
    - Limited-English-Proficient Students
    - Special Education Students

The Mathematics Framework also includes a chapter that focuses squarely on instruction. Entitled, "Delivery of Instruction in Mathematics," the chapter's subtitles are as follows:

- Teaching for Understanding
- Reinforcement of Concepts and Skills
- Problem Solving
    - Procedures in Problem Solving
        - Formulating Problems
        - Analyzing Problems and Selecting Strategies
        - Finding Solutions
        - Verifying and Interpreting Solutions
    - Summary of Problem Solving
- Situational Lessons
- Use of Concrete Materials
- Flexibility of Instruction
- Corrective Instruction/Remediation
- Cooperative Learning Groups
- Mathematical Language
- Questioning and Responding

In contrast, the History-Social Science Framework does not include a special section on instruction. Rather, the narrative descriptions of courses from kindergarten through Grade 12 provide relatively detailed descriptions of how to teach as well as what to teach. For example, the section calling for the presentation of three kindergarten units includes a number of references to instructional strategies, such as the following:

> Children should have opportunities, under the teacher's guidance, to explore the school and its environs, a new world for these children, as well as the landscape of the neighborhood, including its topography, streets, transportation systems, structures, and human activities. Children should have opportunities to use large building blocks, wood, tools, and miniature vehicles as well as a variety of materials from a classroom box filled with imaginative and improvisational objects, clothing, workers' hats, and the like in order to construct real and imagined neighborhood structures. (History-Social Science Curriculum Framework and Criteria Committee, 1988, pp. 33-34)

Guidelines for Assessing Student Learning

Only two of the four frameworks include a section spelling out guidelines for assessing student learning. The Science Addendum refers readers to the 1978 edition of the Science Framework in which "a variety of evaluation techniques are discussed and related to specific objectives" (Science Curriculum Framework and Criteria Committee, 1984, p. 6). Likewise, the History-Social

Science Framework does not make any reference to student assessment. The Mathematics Framework, on the other hand, includes a short section on "Testing" that is presented in the opening chapter. This section presents very general directives such as the following:

> In support of the program called for by this framework, testing must be concentrated on students' understanding of mathematical concepts and their ability to use their knowledge in new situations. Teachers must also be able to assess the students' abilities to carry out particular mathematical procedures. . . . Testing of problem solving, or the ability to apply concepts and skills in new and unexpected situations, should include items that require students to formulate mathematical problems, select alternative strategies for solving problems, make generalizations, and verify and interpret solutions . . . Staff development activities will be required for teachers to learn to develop, administer, and evaluate such tests. (Mathematics Curriculum Framework and Criteria Committee, 1985, pp. 5-6)

In contrast to the other frameworks, the English-Language Arts Framework devotes a full (albeit short) chapter to classroom assessment and school, community, and state assessment. The section on classroom assessment asserts that evaluation in English-language arts must include informal assessment of students' speaking, reading, and writing as well as more formal evaluations. The authors also decry the limitations of objective multiple-choice tests and argue that, "teachers, students and parents are offered a more accurate picture of students' facility with English-language arts by using a variety of assessment strategies" (English-Language Arts Curriculum Framework and Criteria Committee, 1987, p. 34). They then list 19 examples of the types of strategies they have in mind, including

> Individual consultations between student and teacher while other students are, for example, doing silent reading or quiet group work offer the teacher insight about the individual student's understanding and problems.
>
> Five-minute speeches on topics such as A Defense of Democracy provide information on the students' depth of understanding of social and political issues. (English-Language Arts Curriculum Framework and Criteria Committee, 1987, p. 34)

Criteria for Evaluating Instructional Materials

One of the primary purposes for developing curriculum frameworks is to provide a conceptual foundation for the derivation of standards that guide formal reviews of instructional materials submitted for state adoption. Consistent with this purpose, all four frameworks include detailed lists of criteria for evaluating instructional materials. The Mathematics Framework, for example, lists 28 standards that describe ways in which mathematics textbooks and supplementary materials are expected to align with the mathematics curriculum outlined in the framework (e.g., "Lessons for every student, below as well as above average, include the major concepts and skills of every strand. No student is excluded from studying some areas because of difficulty in other areas") [Mathematics Curriculum Framework and Criteria Committee, 1985, p. 20]. A later section of this report focusing on state textbook adoption will consider these and other criteria in more detail.

The Role of Handbooks and Model Curriculum Guides

Two series of documents--handbooks and model curriculum guides--translate the frameworks into more practical guidelines for district curriculum planners, inservice directors, and classroom teachers. The series of handbooks in mathematics, foreign languages, physical education, writing, and literature provide relatively detailed lists of criteria to guide reviews of K-12 instructional programs in local schools. The model curriculum guides in mathematics, science, and English-language arts have a somewhat broader range of purposes. This series of documents describes the essential characteristics of effective programs and provides specific examples of the kinds of lessons elementary and middle-school teachers can use to engage pupils in higher order thinking. Thus, classroom teachers and directors of local professional development

programs are likely to find the curriculum guides more helpful than the handbooks.

Handbooks for Planning Effective K-12 Programs of Instruction

To date, Handbooks for Planning Effective Instructional Programs for Kindergarten Through Grade 12 have been prepared in Mathematics (1982), Foreign Languages (1985), Physical Education (1986), Writing (1986), and Literature (1988). Efforts are also underway to extend this series to history-social science and to the visual and performing arts. The central purpose of each handbook is to serve as a guide for assessing and improving a school's instructional program in the relevant content area. Thus, each handbook seeks (a) to enhance awareness and understanding of the essential characteristics of effective programs in the relevant content area, and (b) to help those who plan and implement curricula at the local level--classroom teachers, school administrators, curriculum specialists, parents, and students--identify the strengths and shortcomings of existing programs and recommend improvements.

The four handbooks that were developed from 1983 through 1988 are similar in style and organization. Each describes the essential elements of an effective program, provides guidelines for program implementation, and presents a checklist for assessing the quality of a school's program in the relevant content area. Across all handbooks, there are clear and direct links between the criteria listed in the checklist and the rationale for those criteria presented in other sections of the handbook. In other words, those who conduct program reviews can readily identify the stated rationale for each criterion. The following overview of the Handbook for Planning an Effective Literature Program (Literature Handbook Committee, 1988) illustrates the general format and intended purposes of the handbooks.

Overview of the *Handbook for Planning an Effective Literature Program*

The introduction to the literature handbook indicates that it is "designed to provide useful information for all those responsible for improving the English-language arts course of studies, especially school level planners, teachers, and parents" (p. 3). Chapter I discusses the value of teaching literature. It argues that literature (a) promotes aesthetic and intellectual growth, (b) fosters a sense of citizenship, (c) helps build a sense of rootedness, and (d) plays a significant role in developing students' sense of ethical responsibility.

Chapter II provides an overview of an effective literature program. It begins by distinguishing among three literature programs--core, extended, and recreational-motivational:

- Literary works in the core literature program are identified by a school or district. These works encompass all literary genre, and provide a "broadly representative sampling of our literary heritage." The expectation is that all students will consider these works through close reading and other means.

- "The extended program is composed of those works that the teacher recommends for students to read on their own time to supplement classwork." The intent is for teachers to adapt these readings to the special interests and abilities of individual students.

- The recreational-motivational reading program consists of independent reading materials that are recommended by librarians and teachers and are readily accessible to students. The intent of this facet of the literature program is to encourage a curiosity about books and a positive attitude toward reading. (Literature Handbook Committee, 1988, pp. 14-15)

The handbook identifies three criteria for selecting core literary works: (a) suitability for students (e.g., should pose a realistic challenge), (b) depth of content, and (c) language use. Surprisingly, this discussion makes no reference to the Recommended Readings in Literature published by the Language Arts and Foreign Language Unit of the California State Department of Education in 1986. The Recommended Readings document lists 1,010 books covering the

spectrum of children's literature and classifies each selection as core works or extended materials for specific grade spans (e.g., K-2). The final sections of Chapter II of the Handbook for Planning an Effective Literature Program provide suggestions for teaching literature at each of the four grade ranges--Kindergarten through Grade 3 (e.g., an ideal time for storytelling), Grade 4 through 6 (e.g., well-written novels can help students experience early American life vicariously), at the junior high school level, and at the senior high school level.

Chapter III describes "The Teacher's Role in the Program." The authors argue that,

> In a literature class, the focus should be on the relation between the student and the text. The teacher's role is to deepen, enrich, and clarify the quality of the relation between the student and the text. . . . The best literature teachers are those who create an atmosphere of trust in class discussions, who listen attentively to each student's comments, and then draw out consequences by means of probing questions. . . . In measuring student achievement in the literature program, teachers must be very careful in selecting their methods of assessment. By its very nature literature is not particularly amenable to objective testing. (Literature Handbook Committee, 1988, p. 32-33)

Chapter III also discusses (a) the need to plan appropriate activities for three stages of instruction--before, during, and after the reading, and (b) guidelines for teaching literature to limited-English-proficient students (e.g., when working with ESL students, it may be appropriate for teachers to substitute translations of classics).

Chapter IV describes "aids to an effective literature program" including relatively brief descriptions of (a) parental support for the literature program (e.g., parents should pause to explain difficult words they use in their conversations with children), (b) in-service teacher education (e.g., teachers should have opportunities to share successful teaching strategies with peers), and (c) the school library/media center (e.g., the center should have

audiotapes and recordings of readings from the works of authors being studied). Finally, Chapter V provides a "Checklist for Assessing a School's Literature Program." Those who use the checklist are encouraged to think of the list "as a means for reviewing a school's literature program in order that they might become more aware of the program's strengths and possible weaknesses. It can also be useful in helping them plan, develop, and implement a new program as appropriate" (Literature Handbook Committee, 1988, p. 44). The checklist includes

(a) 13 criteria related to the core program (e.g., Do all professional staff feel a sense of ownership in the selection of core literary works?)

(b) 8 criteria related to the extended literature program (e.g., Is a locally determined extended list of works available for students to read on their own with guidance from classroom teachers?)

(c) 7 criteria related to the recreational-motivational program (e.g., Do teachers model reading for pleasure through activities such as daily periods of uninterrupted sustained silent reading?)

(d) 12 criteria related to the teacher's role in the program (e.g., How effective are teachers in providing: "classroom discussion and student writing in various modes of discourse that help students discover relationships between literature and their own lives? . . . the development of a literature program suitable to needs of students whose dominant language is not English? . . . frequent opportunities for students to hear literature, in general, and poetry and drama, in particular, read aloud and orally interpreted by teachers, students, and recorded artists? . . . a program for assessing student achievement in literature in which objective testing is deemphasized and subjective assessment such as essay tests, anecdotal records, oral and written reports, and the evaluation of the quality of student discussion, is emphasized?" (Literature Handbook, p. 48)

(e) 8 criteria related to parental support for the literature program (e.g., Are parents encouraged to read aloud to their children?)

(f) 7 criteria related to in-service teacher education (e.g., Are teachers involved in planning and implementing in-service education programs?)

(g) 9 criteria related to the school library/media center (e.g., Is the library/media center open at convenient times before, during and after the school day?)

Model Curriculum Guides: Kindergarten Through Grade Eight

As noted in the introduction to this report, Senate Bill 813 enacted by the California legislature in 1983 reinstituted high school graduation requirements (e.g., three years of English). The legislation also (a) required the Superintendent of Public Instruction to develop and publish model curriculum standards to improve the quality of required high school courses, and (b) decreed that school districts must compare their local curricula to the model standards at least once every three years.

Collectively, the Model Curriculum Standards "reflect the strongest possible professional consensus about the content that every student should be exposed to before graduating from high school" (Curriculum and Instructional Leadership Branch, California State Department of Education, 1985, p. M-vi). As an extension of the legislative mandate, the State Department of Education elected to publish Model Curriculum Guides for Kindergarten Through Grade Eight. The Guides are coordinated with the Model Curriculum Standards and K-12 Frameworks, and delineate concepts, skills, and activities that are appropriate for elementary and middle school students. To date, Model Curriculum Guides have been prepared for Science (1987), Mathematics (1987), and English-Language Arts (1988). Curriculum guides for history-social science, the visual and performing arts, physical education, and foreign languages are currently being developed.

Multiple Purposes

The Model Curriculum Guides for Kindergarten Through Grade Eight address three general goals:

- To provide a model for local reviews of instructional programs in elementary and middle schools.

- To serve as a guide for the design of inservice programs and activities in the relevant content area.
- To give teachers a clearer understanding of the instructional programs they should try to provide.

The introduction to the curriculum guide for science (Science Curriculum Guide Advisory Committee, 1987) asserts that, "The Science Model Curriculum Guide was written for the purpose of having teachers and school site administrators review the elementary science curriculum and compare it to the idealized model which appears in the pages that follow" (p. 1). In a similar vein, the introduction to the curriculum guide in English-language arts (Science Curriculum Guide Advisory Committee, 1987) urges curriculum planners "to compare existing programs, which are often fragmented, overly skills oriented, joyless, and outdated, with the program advocated in this guide. They are further urged to consider making changes as appropriate" (English-Language Arts Curriculum Guide, p. 1). Thus, the curriculum guides extend the program assessment mission of the Model Curriculum Standards to the elementary and middle school levels. But, in contrast to the Model Curriculum Standards, the California legislature has not required local districts to use the Model Curriculum Guides as aids in conducting periodic reviews of the K-8 curriculum.

Whereas the authors of the K-8 Model Curriculum Guides made a deliberate attempt to articulate the Guides with the Model Curriculum Standards for secondary schools, the intended relation between the Curriculum Guides and the Handbooks for the various subject areas is less clear. Recall that the program assessment function of the Curriculum Guides overlaps with the central purpose of the Curriculum Handbooks (i.e., to provide guidance for local curriculum reviews). It is, therefore, not clear whether the Curriculum Guides are to be used in concert with the Handbooks or as their replacements. The authors of the Model Curriculum Guide for English-Language Arts (English-Language Arts

Curriculum Guide Advisory Committee, 1988) suggest that the Guide aligns with the writing and literature handbooks and that the handbooks provide a "more complete discussion of the major ideas in this guide" (p. 4). Thus, the Curriculum Guides and Handbook are meant to complement each other, with the handbooks providing more in-depth guidelines in selected areas. In contrast, the authors of the Model Curriculum Guide for mathematics make no reference to the Mathematics Handbook published in 1982, leading this author to believe that their intent is for the Curriculum Guide to supersede the Handbook in this content area. (I will return to this issue in the final section of this report.)

As stated in the Mathematics Model Curriculum Guide, Curriculum Guides are also "designed to be a guide and resource for persons with major mathematics curriculum or staff development responsibility. It will help them establish specifications and assessment criteria for long-term improvement efforts" (p. 1). This aim is repeated verbatim in the Curriculum Guide for Science. According to the state's director of mathematics education, those individuals who are responsible for local inservice programs are the central audience for the curriculum guide. Finally, Curriculum Guides are also designed to improve teachers' understanding of the intended curriculum in the relevant subject area. As stated in the Model Curriculum Guide for Science (Science Curriculum Guide Advisory Committee, 1987), "Elementary teachers can and should, over a period of time, read Part II (of the Curriculum Guide) carefully to acquire a more tangible vision of the science program that they can, with sustained support, gradually provide" (p. 2).

Overview of Curriculum Guides in Science, Mathematics, and English-Language Arts

Science and mathematics. The formats of the Science and Mathematics Curriculum Guides are similar. Part I of each guide provides an overview of important characteristics of strong elementary school programs in the relevant subject area. Its central purpose is to aid teachers, principals, and parents in assessing the quality of local science or mathematics programs. Part II provides a more detailed portrait of elementary school programs that are "focused on the development of student understanding" in science or mathematics. It includes specific examples of lessons teachers can use to enhance student understanding and thinking, and "is designed to be a guide or resource for persons with major responsibility for science (or mathematics) curriculum or staff development" (Science Curriculum Guide, Advisory Committee, 1987, p. 2). It is also designed to enhance teachers' understanding of the intended curriculum.

Science. Part I of the Model Curriculum Guide in Science begins with an overview of issues that must be addressed in designing an elementary school science program. These issues include (a) adequate time for science instruction, (b) administrative support, (c) spiraling and articulation of science concepts, (d) provisions for professional staff development, and (e) systematic program evaluation. Important characteristics in operating the program are also addressed in Part I. They include

- instructional focus: (e.g., "Conceptual understanding cannot be fully realized without the texture added by conducting experiments, observing appropriate demonstrations, and discussing the societal implications of scientific and technological advances.")
- experiential learning: (e.g., "Experiential learning is the acquisition of content and skills through active participation.")

- open discussion of attitudes, ethics, and values: (e.g., "Students must come to realize that science is a human endeavor and not a value-free body of knowledge.")

- integration of science throughout other disciplines: (e.g., "reading stories with scientific themes. . . sketching various life forms to appreciate the similarities and differences in nature.") [Science Curriculum Guide Advisory Committee, 1987, pp. 5-6]

Part II of the Model Curriculum Guide presents practical examples of lessons focusing on the major concepts that were cited in the Addendum. Using a format paralleling that of the Addendum, concepts and lessons are listed for six categories of biological science, four categories of earth science, and seven categories of physical science. The Guide presents two illustrative lessons for each concept considered at the lower elementary level (one lesson for kindergarten and first grade and one for Grades 2 and 3) and one lesson for each concept considered at the upper-elementary level (Grades 4 through 6). The following example illustrates the organization of the Curriculum Guide and the ways in which lessons are described

Biological Science (Grades 4-6)

Plants (Grades 4-6)

Humans use plants to create machines, clothing, building materials, fuel, food, etc.

- List several items in the classroom, such as paper and wooden tables, that are made from plants. Then ask students to bring items from home and assemble an in-room 'museum' with labels to show plant uses for medicine, clothing, wood, fuel, food, etc. Invite another class to visit this "museum" and learn more about the display by asking your students to explain these helpful uses for plants.

- During a social studies unit on California Native Indians, give some examples of how they used plants. Then ask students to find in reference materials many examples of the unique uses of plants by our Native Americans. Students may construct models of housing structures and boats from reeds, bark, brush, and wooden plants; make a chart, diorama, or model to show the stage of acorn flour preparation or gather plants and label each to show how they were used as medicines. (Science Curriculum Guide Advisory Committee, 1987, p. 35)

The Science Model Curriculum Guide ends with four appendixes that "teachers could use in generating and maintaining students' interest in science" (p. 89). The first three appendixes provide one-paragraph descriptions of (a) biographies of scientists, (b) scientific discoveries (e.g., big bang theory), and (c) scientific literature that is appropriate for elementary students. The final appendix lists science materials for grades K-3, 4-6, and 7-8 (e.g., aquarium, rock samples, tweezers).

Mathematics. Part I of the Model Curriculum Guide in Mathematics is similar to Part I of the Science Guide. It begins with a discussion of issues that must be addressed in designing an elementary school mathematics program. These issues include (a) aligning tests and instructional materials with the school's intended curriculum, (b) articulating expectations for student learning across grades, (c) providing for the range of students' aptitudes, and (d) making appropriate homework assignments. The discussion then shifts to salient characteristics of high quality mathematics programs. These characteristics include

- Previously learned concepts and skills are reinforced in each grade through problem assignments that require their use in a variety of new situations with real world settings.

- All students, especially those who are slowest to acquire abstract understanding, constantly have individual and group opportunities to explore, conjecture, test, discover, invent. Students are helped to approach mathematics with a common sense attitude and to understand not only how but also why different procedures are applied in different situations.

- Problem solving abilities are deliberately and consistently developed throughout the program.

- Students at each grade level initially work with concrete materials when developing concepts.

- The hand-held calculator is fully incorporated into the program.

- All students are instructed in the fundamental concepts of each strand, with no student limited to the computational aspects of the number strand (Mathematics Curriculum Guide Advisory Committee, 1987, pp. 4-6)

Part II of the Mathematics Guide begins with a discussion of the need to teach for understanding and thinking in mathematics and the presentation of instructional guidelines that center on this goal [e.g., "Whenever possible, we should engage the students' thinking and teach the mathematical ideas through posing a problem, setting up a situation, or asking a question" (p. 13)]. The discussion then shifts to "essential understandings."

> Children may learn many facts and skills related to mathematics, but they will not be able to discern mathematical relationships, reason logically, and use mathematical techniques effectively unless they understand certain basic, underlying mathematical ideas. We are referring to these basic mathematical ideas as the "essential understandings." (Mathematics Curriculum Guide Advisory Committee, 1987, p. 15)

The Guide then lists essential understandings for each of the seven strands of mathematics and presents examples of situations and questions that "will give students opportunities to confront the important ideas that are embodied in the particular understanding" (p. 15). The examples address each of the three grade ranges: K-3, 3-6, and 6-8.

The numbers of essential understandings that are cited for each of the seven mathematics strands range from three to five. Examples include

- Number: "The degree of precision needed in calculating a number depends on how the result will be used" (p. 22).
- Measurement: "Choosing an appropriate measuring tool requires considering the size of what is to be measured and the use of the measure" (p.25).
- Geometry: "Geometric figures can be composed of or broken down into other geometric figures" (p. 32).
- Patterns and Functions: "Identifying a rule that could have been used to generate a pattern enables one to extend that pattern indefinitely" (p. 35).

- Statistics and Probability: "Data can be organized, represented, and summarized in a variety of ways" (p. 42).

- Logic: "Based on certain premises, a series of logical arguments can be used to reach a valid conclusion" (p. 49).

- Algebra: "The properties of operations on variables are the same as the properties of operations on numbers" (p. 53).

The following example illustrates the descriptions of situations and questions that follow the statement of each essential understanding. The essential understanding in this example is, "An equality relationship between two quantities remains true as long as the same change is made to both quantities."

K-3: Children in the primary grades will work with sets of objects to develop the idea of an equality relationship as a basis for understanding later work with equalities.

Each of you has ten raisins. When you have eaten half of your raisins, will each of you have the same number?

Linda has four pebbles in one hand and five pebbles in the other hand. Paul has two pebbles in one hand and seven in the other hand. Jane has four pebbles in one hand and three in the other. Steve has nine pebbles in one hand and none in the other hand. Which children have the same number of pebbles? (Mathematics Curriculum Guide Advisory Committee, 1987, p. 52)

The final section of the Mathematics Curriculum Guide is entitled "Elaborated Classroom Experiences." It presents three sets of lessons centering on statistics, number, and geometry, with each set describing three different teachers working with youngsters from one of the three grade ranges (K-3, 3-6, or 6-8). The descriptions also highlight the decisions teachers made at various points in the lesson and their rationale for each decision. The purpose of the descriptions, according to the authors, "is to show how the programs envisioned by the 'Mathematics Framework' and this curriculum guide might actually look in classrooms" (p. 55).

English-language arts. The organization of the Curriculum Guide for English-Language Arts is different from that of the other two guides. It begins with a list of 11 general recommendations that focus on broad areas of instruction that are "amendable to educational policymaking" and then presents 22 recommendations, called guidelines, each of which focuses on only one aspect of an effective language-arts program. The discussion of each guideline includes three "representative enabling activities. . . [that]. . . make the ideas encompassed in each guideline more explicit and concrete" (English-Language Arts Curriculum Guide Advisory Committee, 1988, p. 4). The authors anticipate that the Guide "will serve as a motivator for educators to develop a more extensive array of locally appropriate representative enabling activities, which then become the backbone of a new local program" (English-Language Arts Model Curriculum Guide, p. 4).

The list of "general recommendations" cited in the introduction includes the following:

1. The language arts program should be addressed to meet the needs of all students regardless of levels of ability, socioeconomic status, or their familiarity, experience, and skill with the English language.

2. An adequate amount of time should be allocated and spent on the language arts program in general and each of its components in particular; this is particularly pertinent in the areas of listening and speaking, which are often neglected in the curriculum.

3. The atmosphere of the language arts classroom should be such that the students have ample opportunities to discuss, listen, read, write, and also to experience literature in a setting which fosters active and not merely passive participation. (English-Language Arts Curriculum Guide Advisory Committee, 1988, p. 1-2)

The 22 guidelines that follow are presented in five major groupings. Examples of guidelines for each of these groupings include the following:

I. The English-language arts program emphasizes the reading and the study of significant literary works. (This grouping includes three guidelines.)

Example: Guideline 2--"All students, individually and in small groups, read and respond in a variety of ways to literary works, selected with the help of the teacher, that extend or enhance the classroom study of core works." (p. 7)

II. The English-language arts program includes classroom instruction based on students' experiences. (This grouping includes two guidelines.)

Example: Guideline 4--"Students draw on their past and present experiences as they listen, speak, read, and write." (p. 10)

III. English-language arts instruction is based on an interrelated program in which listening, speaking, reading, writing, with literature as the core, are taught in concert and are mutually reinforcing. (This grouping includes eight guidelines.)

Example: Guideline 8--"Students learn and use a variety of reading comprehension strategies and, with the help of the teacher, learn to monitor and adjust their own strategies to better comprehend what they encounter in print." (p. 16)

IV. English-language arts are an integral part of the entire curriculum. (This grouping includes seven guidelines.)

Example: Guideline 15--"Students respond both orally and in writing to questions which help them to acquire and use higher-order thinking skills in all subject areas." (p. 25)

V. Evaluation of the English-language arts program includes a broad range of assessment methods. (This grouping includes two guidelines)
Example: Guideline 22--"Students develop skills for assessing and monitoring their own performance and progress in the language arts" (p. 32).

As noted earlier, examples of three enabling activities--one for each of the three grade ranges--K-3, 3-6, and 6-8--are presented for each guideline. The following example is illustrative of the types of enabling activities that are cited.

Guideline 19: All school staff members demonstrate effective communication skills by reading and writing along with and in view of the students and by modeling listening and speaking skills throughout the school day.

- Representative Enabling Activities -

Kindergarten Through Grade Three:

> The teacher models how to make a sentence interesting, descriptive, and informative. Using a basic sentence contributed by the students, such as "I have a dog," the teacher demonstrates how to provide additional information. By eliciting from students ideas for more details, the teacher writes on the chalkboard a more complete version of the simple sentence, which might become, "I have a little brown terrier that loves to chase cats and kiss me on the nose." The teacher repeats the process by modeling the development of a new sentence. Working in small groups, the students emulate the process and produce their own similar sentences. (English-Language Arts Curriculum Guide Advisory Committee, 1988, p. 28-29)

The Role of State Adoptions of Instructional Materials

Overview of the Textbook Adoption Process

As noted in the introduction, the Constitution of the State of California grants authority to the State Board of Education to adopt textbooks and other instructional materials for use in kindergarten through Grade 8. The Curriculum Development and Supplemental Materials Commission (Curriculum Commission) acts as an advisory body to the State Board in carrying out this function and is, in turn, assisted by the State Department of Education. The policies and procedures governing the adoption process are spelled out in considerable detail in a 1988 State Department of Education document entitled, Instructional Materials and Framework Adoption: Policies and Procedures. The critical steps in the process are outlined in Figure 2 which is taken from that document.

As the first step in the process, materials submitted for adoption are evaluated by Instructional Materials Evaluation Panels (IMEPs). Members of these panels are appointed by the State Board of Education and are later trained by members of the appropriate Subject Matter Committees (SMCs) of the Curriculum Commission. Their charge is to review instructional materials for "factual and technical accuracy, educational value, and quality. . . in

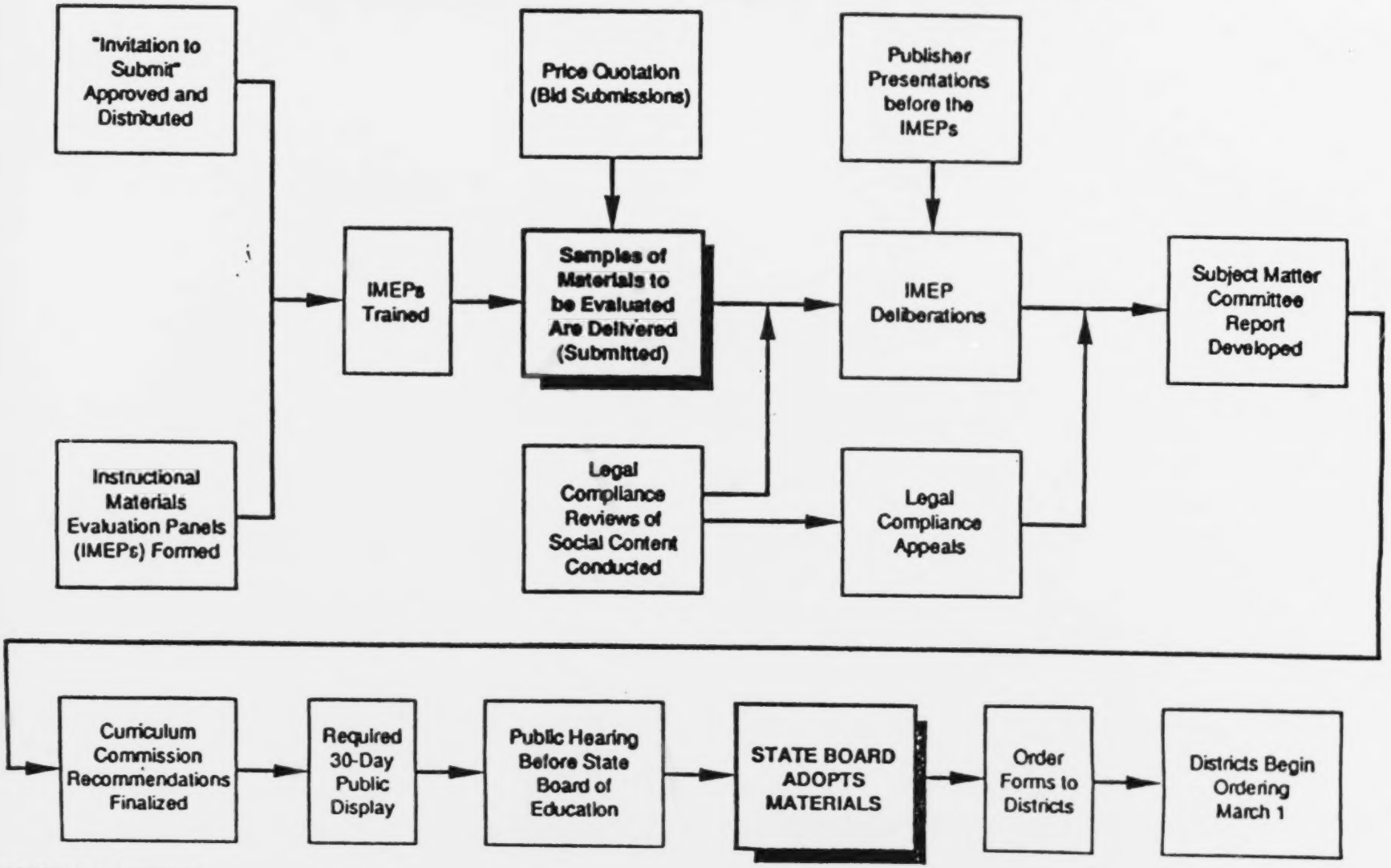
accordance with the framework and criteria and evaluation instruments approved by the Board" (Office of Curriculum Framework and Textbook Development, 1988, p. 24). Although the number of IMEP panels varies somewhat across different subject areas as a function of the number of submissions to be reviewed, there are typically three independent panels. The composition of each panel reflects gender, ethnic, and geographic diversity and emphasizes the representation of "teachers and other curriculum personnel from county offices and school districts, the primary qualification being subject matter expertise" (Office of Curriculum Framework and Textbook Development, 1988, p. 23).

IMEP members initially review materials independently. They then meet with other members of the panel to which they are assigned to conduct an intensive, collective review. Each panel completes a preliminary summary evaluation which reflects the consensus judgments of the group and includes ratings of each submission and the rationale for recommending or not recommending the materials. The publishers then have an opportunity to respond to identified weaknesses or concerns and the final IMEP reports are sent to the appropriate Subject Matter Committee (SMC) in the Curriculum Commission. The Subject Matter Committee, in turn, reviews the reports from each of the panels and submits its recommendations to the Curriculum Commission for the adoption of 5 to 15 basic instructional materials programs for each grade level. The SMC also prepares the final justification for each recommended item and the rationale for rejecting items not proposed for adoption that will appear in the Curriculum Commission's report to the State Board. After making any deletions or additions it deems advisable, the Curriculum Commission submits its report to the State Board of Education. The Board then conducts a public hearing, collects whatever additional information it deems desirable (e.g., evaluation sheets), hears

FIGURE 2

INSTRUCTIONAL MATERIALS ADOPTION PROCESS

This flow chart shows the relationships between the major components of the adoption process. Approximately 12 months are involved from the time of submission of samples to State evaluators to the time districts can begin ordering adopted materials.


"Invitation to Submit" Approved and Distributed
Price Quotation (Bid Submissions)
Publisher Presentations before the IMEPs
IMEPs Trained
Samples of Materials to be Evaluated Are Delivered (Submitted)
IMEP Deliberations
Subject Matter Committee Report Developed
Instructional Materials Evaluation Panels (IMEPs) Formed
Legal Compliance Reviews of Social Content Conducted
Legal Compliance Appeals
Curriculum Commission Recommendations Finalized
Required 30-Day Public Display
Public Hearing Before State Board of Education
STATE BOARD ADOPTS MATERIALS
Order Forms to Districts
Districts Begin Ordering March 1

Reproduced from "Instructional Materials and Framework Adoption: Policies and Procedures" (California State Board of Education, 1988)

testimony from any interested parties, and determines the final list of materials that are adopted.

The Role of State Adoptions in Curriculum Reform

State adoption of instructional materials is a critical element in California's policy framework. Because it controls at least 10% of the total national market, California can influence the design of instructional materials in kindergarten through Grade 8. The state has taken full advantage of this opportunity in its press for curriculum reforms. According to the results of our 50-state survey, California is the only state that has aggressively pressed textbook publishers to develop books or other instructional materials that support the state's call for curriculum reform.

As noted in the introduction, the prominent role of textbook adoptions in California's guidelines for curriculum reform is evidenced by the fact that the State Board of Education refused to adopt K-8 instructional materials that failed to adequately address the state's curriculum frameworks in science in 1985, mathematics in 1986, and English-language arts in 1987. Proposed junior high school science books were rejected if they failed to give adequate attention to scientific theories such as evolution or major ethical concerns.

In 1986, all of the proposed K-8 series in mathematics were initially rejected. Publishers were then given an additional year to revise their series. Ultimately, six publishers submitted materials that were approved by the State Board of Education. Proposed English-language arts materials were rejected if they included only a few literary works or if they used "literature as 'window dressing' while focusing on skill development, study of genre and literary analysis" (Curriculum Development and Supplemental Materials Commission, 1988a, p. 3). The State Board of Education also rejected (a) all of the spelling

programs that were submitted because they failed to teach spelling in an integrated reading and writing context, and (b) ancillary materials such as skills pads, drill cards, or kits emphasizing one-word (fill in the blank) responses because these materials "cover only fragments of language . . . and rob students of valuable time to engage in meaningful listening, speaking, reading, and writing activities" (California State Department of Education News, July, 1988, p. 3).

Written Specifications for Instructional Materials

Written specifications for instructional materials are a key element in providing clear channels of communication with publishers. These specifications are described in two different documents--curriculum frameworks and instructional materials evaluation forms.

Standards cited in curriculum frameworks. Each curriculum framework includes a list of standards that serve as criteria for textbook and materials adoptions. The Mathematics Framework (Mathematics Curriculum Framework and Criteria Committee, 1985), for example, lists 28 standards that deal with the following areas of concern:

(a) Content (e.g., "Problems in the text require the student to apply concepts and skills from all the strands in a variety of practical situations. . . Examples and exercises show how mathematics is applied in other disciplines, such as natural science, social science, art, music, business, medicine, and law, and in everyday life," p. 19).

(b) Organization and Presentation of Lessons (e.g., "Lessons for every student, below as well as above average, include the major concepts and skills of every strand. No student is excluded from studying some areas because of difficulty with other areas. . . Lessons often begin with problem situations that. . . require students to formulate mathematical problems," (p. 20).

(c) Assignments (e.g., "Problem sets are classified into subsets of varying degrees of difficulty and are properly identified as such. . . The student is often directed to activities outside the textbook, such as. . . obtaining data from real situations," p. 20).

(d) Assessment and Evaluation Materials (e.g., "Materials are included that provide a means for regular assessment of students'. . . ability to identify appropriate procedures, explain reasoning, and demonstrate techniques for problem solving," p. 20).

(e) Auxiliary/Supplementary Materials (e.g., "Instructional materials that accompany the student's textbook deepen or extend textbook material rather than provide for repetitive practice with narrow skills," p. 21).

Instructional materials evaluation forms. The deliberations of the Instructional Materials Evaluation Panels (IMEPs) are guided by instructional materials evaluation forms. These forms translate the standards presented in the relevant subject area framework into a set of categories or criteria that structure individual previews, panel discussions, and finally, consensus ratings of submitted materials. In order to provide a clearer sense of the intent of each category or criterion, the evaluation forms also cite specific standards from the relevant framework that should be considered when rendering a judgment for that category. Table 2 is taken from the "Mathematics Instructional Materials Evaluation Form" (Curriculum Development and Supplemental Materials Commission, 1986) and illustrates this format.

In the 1986 review of mathematics materials, IMEP panels used a 7-point scale to rate each series' treatment of content, understanding, problem solving, number sense, student experiences, pedagogy, management of instruction, format, and ancillary materials. Panels were instructed to make a single, global rating for each category and to collect evidence to support that rating. In 1988, instructional materials evaluation panels created a 5-point scale to be used in 1990 to rate history-social science materials across four general categories, with each category assigned a weight based on its overall importance (Curriculum Development and Supplemental Materials Commission, 1988b). The four categories were content (possible points = 700), organization

(possible points = 200), teacher manuals and reference materials (possible points = 100), and assessment and evaluation (possible points = 50). In contrast to the other three categories, the content category was subdivided into 15 criteria that will be rated independently [e.g., alignment with framework's course descriptions (possible points = 100); inclusion of ethical issues in history (possible points = 25)].

Negotiations With Publishers

As these descriptions suggest, publishers who are eager to understand the conditions specified in a given framework and to eventually design instructional materials that will satisfy these conditions can pursue several courses of action. According to the Director of the Office of Curriculum Framework and Textbook Development, they might

1. Attend open meetings of the framework committee throughout the development of the framework. In this way, publishers can (a) track the evolution of ideas and the development of textbook criteria, and (b) understand why certain issues and criteria are viewed as important. Publishers will also have an opportunity to interact with committee members to explore ideas regarding the ways in which books or other instructional materials might be developed.

2. Review the instructional materials evaluation forms. These forms are developed by the Curriculum Committee approximately two years before the actual review takes place. Thus, publishers can look to these documents for a fairly clear sense of which criteria will be weighted most heavily.

3. Attend framework implementation conferences around the state. These conferences occur during the year following the release of a new framework and provide an additional opportunity for publishers to check on their understanding of the framework. These conferences also provide multiple opportunities for publishers to interact with authors of the framework.

4. Request copies of all materials that are distributed during evaluators' training sessions as well as tapes of these presentations.

5. Meet informally and formally with members of the Curriculum Committee. There are multiple opportunities for publishers to meet informally with the 18 members of the Curriculum Committee. There are also two formal meetings with the Committee in which publishers present their

Table 2

Problem Solving

The program provides many opportunities for students to be actively involved in applying their mathematical knowledge, skills, and experience to problem solving situations that are new and/or perplexing to them.

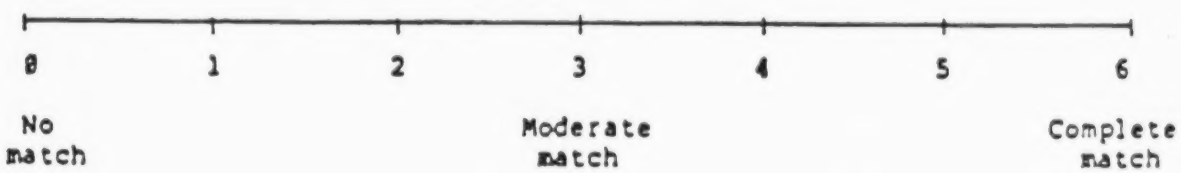
The problem solving situations frequently resemble real situations in their richness and complexity and incorporate concepts from several strands. They contrast sharply with narrow exercises that are designed to give practice with specific procedures or strategies.

The development of mathematical thinking and reasoning skills that are essential to problem solving occurs throughout the program.

Rather than treating problem solving as a collection of specific steps and strategies to learn, the program emphasizes that problem solving is a process, with solutions coming often as the result of exploring situations, stating and restating questions, and devising and testing strategies over a period of time.

- Students have experiences with the components of problem solving including formulating problems, analyzing problems and selecting strategies, finding solutions, and verifying and interpreting solutions.
- The program promotes an atmosphere where students are rewarded for risk-taking, even when their approaches do not yield viable solutions.
- Students are encouraged to frequently discuss and explain their thinking processes with others so that they realize that the components of problem solving cannot be followed in a lock-step sequence and that a variety of approaches and strategies may be used to solve a given problem.

To what extent does the program match this description?



Evidence to support rating:

Reprinted from "Curriculum Development and Supplemental Materials Commission Mathematics Instructional Materials Evaluation Form" (Curriculum Development and Supplemental Materials Commission, 1986), p. 3.

materials. It is possible, for example, to meet privately with content area experts on the committee to explore ideas about the directions a textbook series in that area might take.

With multiple opportunities for publishers to come to understand the types of materials the framework and Curriculum Committees have in mind and a three-year time span from the time a framework is completed to the date of state textbook approval, the expectation is that publishers will design instructional materials that are closely aligned with California's curriculum frameworks for Grades K-8.

The Role of the California Assessment Program

Historical Origins

Legislation passed in 1961 required local districts throughout California to administer achievement tests in public schools. From that date to the present, districts have typically administered (a) commercially prepared standardized achievement tests that they have selected (even though they are no longer required to do so), and (b) tests that were selected or designed by the state. At the present time, for example, approximately 80% of California's districts administer the California Test of Basic Skills as well as the mandatory tests that are part of the California Assessment Program (CAP). District testing programs focus on diagnostic assessment of individual students; CAP tests provide school- and district-level data that are used to assess program quality.

Statewide achievement testing began in 1962. From 1962 through 1972, the state selected one or more standardized tests to be administered across various grade levels. These tests measured achievement in reading, written expression and mathematics. But, the tests had two major disadvantages--they did not match the state's curriculum and they took about four hours to administer

(Curriculum, Instruction & Assessment Division, 1986b). Ultimately, the State Department of Education elected to develop its own tests. The California Assessment Program (CAP) began in 1972 and was fully implemented in the 1974-75 school year. Initially, the state worked with outside agencies in developing and administering CAP tests. The development of the Grade 3 and Grade 6 Surveys of Basic Skills in the late 1970s marked the beginning of the State Department of Education's independent development and administration of CAP tests.

According to the director of the CAP program, the period from 1972 to 1983 was characterized by the refinement of matrix sampling and the application of item response theory in ways that maximized the reliability of group scores. Beginning in the late 1970s with the development of the third- and sixth-grade tests, there was also a move toward broader assessment and a concern for testing higher order outcomes and writing. Senate Bill 813 passed in 1983 expanded the scope of the CAP program to include tests of achievement in content areas like science and history-social science. This legislation also required that "all pupils in grades 3, 8 and 10, in addition to those in grades 6 and 12, be tested for achievement" (State of California, 1983, p. 20).

Working under Superintendent Honig's direction, the period from 1983 to 1988 (the time frame for this report) was characterized by the development and implementation of (a) all segments of the new Grade 8 test, (b) direct writing assessment in Grades 8 and 12, and (c) the reading, editing, and mathematics portions of the Grade 12 test. With the introduction of the direct writing assessment tests in Grade 8 in 1987, the CAP program expanded its scope of testing procedures to include performance tests as well as the more traditional multiple-choice format.

Overview of CAP Tests in 1988

Table 3 on the following page provides an overview of tests that were administered in the CAP program in 1988 and the dates on which each of the tests was first introduced. With one minor modification (the initial dates of implementation), this overview was taken directly from a State Department of Education publication. As is evident from the data in Table 3, test development during the period considered in this report centered entirely on the middle and secondary school levels. Thus, by the close of 1988, the 8th- and 12th-grade tests were the only CAP instruments that provided a reasonable match with the new curriculum frameworks. However, by that date efforts were underway to add a new 10th-grade test and to revise the 3rd- and 6th-grade tests to more closely align with the new frameworks.

CAP Tests for Grades Three and Six

If elementary school teachers looked to the CAP tests for guidance in deciding what to teach in 1988, they would have focused their analyses on the 3rd- and 6th-grade tests that were developed prior to 1983. These two tests might best be described as comprehensive tests of basic skills in reading, written language, and mathematics. Nevertheless, these Surveys of Basic Skills did reflect a modest press for higher order outcomes, a push that began in the late 1970s. According to the Director of the CAP Program, the committee that was responsible for designing the reading tests deliberately ignored word attack skills and paid most attention to comprehension. As a result, more than one-half of the 3rd-grade reading test and three-fourths of the sixth-grade test centered on comprehension (literal, inferential, interpretative, and critical/applicative).

Likewise, the committee responsible for designing the mathematics test pushed for an emphasis on problem solving. Like the reading committee, the mathematics committee wanted the Surveys to expand the range of content teachers typically covered. As a result, approximately one-third of the items in both the 3rd- and 6th-grade mathematics tests center on story problems or other forms of application; the other two-thirds assess skills in computation. Perhaps most noteworthy, this ratio holds for each section of the test (each of the 7 areas that are assessed in the 3rd-grade test and 9 areas considered in the 6th-grade test). For example, about one-third of the items dealing with "counting, numeration and place value" require students to use their skills in these areas in the context of word problems [e.g., "Sheri received a check that was written for $503.69. How would the check be written in words?" (Curriculum, Instruction and Assessment Division, 1987, p. 53)].

Despite these qualities, the 3rd- and 6th-grade CAP tests administered from 1983 through 1988 stressed basic skills and fell far short of aligning with the new curriculum frameworks in the areas that were tested. Efforts to call teachers' attention to students' performance on these tests during the time frame for this report (e.g., publishing CAP scores in local newspapers) may have, therefore, undermined rather than enhanced the call for curriculum reforms.

Test development. A matrix sampling plan is used in the design of all CAP tests. Tests developed in accord with this plan yield an abundance of program-diagnostic information with very little cost in test time for students. The Grade 3 survey of basic skills, for example, consists of 1,020 items--270 reading items, 390 written language items, and 360 mathematics items--that reflect a broad range of the reading, written language, and mathematics curricula (see Curriculum, Instruction, & Assessment Division, 1985). This survey is, in

Table 3

CAP Overview: Current and Projected Test Status by Grade Level and Subject 1988-89 through 1992-93[a]

Grade Level	Subject	Date Test Was First Introduced	Under Revision/ Development	Anticipated Implementation
Grade 3	Reading	1980	Revision begins in 1988-89*	1990-91
	Written Expression	1980	Revision begins in 1988-89*	1990-91
	Mathematics	1980	Revision begins in 1988-89*	1990-91
Grade 6	Reading	1982	Revision begins in 1988-89*	1990-91
	Written Expression	1982	Revision begins in 1988-89*	1990-91
	Mathematics	1982	Revision begins in 1988-89*	1990-91
	Science	-	Developmt. began in 1987-88	1989-90
	History-Social Science	-	Developmt. began in 1987-88	1990-91
	Direct Writing Assessmt.	-	Developmt. begins in 1988-89*	1990-91
Grade 8	Reading	1984	Revision begins in 1988-89*	1990-91
	Written Expression	1984	Revision begins in 1988-89*	1990-91
	Mathematics	1984	Revision begins in 1988-89*	1990-91
	Science	1986	-	-
	History-Social Science	1985	Revision begins in 1988-89	1990-91
	Direct Writing Assessmt.	1987	-	-
Grade 10	Reading	-	Developmt. begins in 1988-89*	1990-91
	Written Expression	-	Developmt. begins in 1988-89*	1990-91
	Mathematics	-	Developmt. begins in 1988-89*	1990-91
	Science	-	Developmt. begins in 1990-91	1992-93
	History-Soc. Science	-	Developmt. begins in 1990-91	1992-93
	Direct Writing Assessmt.	-	Developmt. begins in 1990-91	1992-93
Grade 12	Reading	1987	Revision begins in 1988-89*	1990-91
	Editing	1987	Revision begins in 1988-89*	1990-91
	Mathematics	1987	Revision begins in 1988-89*	1990-91
	Science	-	Developmt. began in 1987-88	1990-91
	History-Social Science	-	Developmt. began in 1987-88	1990-91
	Direct Writing Assessmt.	1988	Developmt. began in 1985-86*	1988-89
CAP/CAS Delivery Systems		-	Prototypes to be tested in 1988-89*	Tested models available through contractors in 1990-91

[a]This figure is taken from an unpublished manuscript entitled, "CAP Overview" prepared by the California Assessment Program, California Department of Education in 1988.

*Funding for revision and development of CAP tests and testing of CAP/CAS delivery system prototypes was included in the Governor's budget for 1988-89.

turn, divided into 30 unique forms, each of which includes 13 written language items, 12 mathematics items, and 9 reading items. Each student takes only one of these forms. This plan yields reliable group data for a total of 90 skill areas (29 for math, 27 for reading, and 34 for written language). Most schools receive reports of scores for each of these categories and a total score for each content area.

The primary limitation of matrix sampling is that it does not yield diagnostic information for individual students. The obvious advantage is that it provides far greater breadth of content coverage for each subject area than would be possible with a single instrument. This is perhaps best illustrated in the assessment of writing.

> Individual pupil reporting of test results would base achievement on a single kind of writing for each student, an accomplishment of dubious value since writing ability is not constant across different writing types. Each student would receive a score on a single writing assignment, but the score would not reflect ability in the other kinds of writing. Matrix sampling, however, permits reports on student achievement in a variety of kinds of writing across the range of students at any given school. (Curriculum, Instruction, & Assessment, 1986a, pp. 3-4).

Despite this major advantage, some policymakers favor dropping the matrix sampling plan in favor of tests that will yield diagnostic data for individual students. This position is prompted, in large part, by the fact that teachers often pay closer attention to students' scores on the standardized tests administered in their districts than to the results of the CAP tests. This differential attention may, in turn, stem from the fact that tests that supply data for individual students serve a broader range of functions than tests that provide only group data. Therefore, by designing tests that would provide reliable data for individual students, the CAP program would offset the primary advantage of standardized tests. However, as the Director of the CAP program points out, this gain is likely to be offset by two major disadvantages.

First, it would be very difficult, if not impossible, to design and administer performance tests such as direct writing assessment or systematic observations of problem solving activities if scores must be derived for each student. Second, the provision of diagnostic scores for individual students would encourage teachers to continue to use a fragmented, diagnostic-prescriptive approach to assessment and instruction, an approach that is in direct conflict with the more holistic orientation the state is eager to promote. Given these arguments and counterarguments, it is evident that the final resolution of this controversy is likely to have a major influence on the role CAP tests play in California's curriculum reform efforts.

Development of the third-grade test. The design and development of CAP tests within each content area are overseen by committees known as Assessment Advisory Committees. These committees include teachers (two-thirds or more of the total membership), representatives of various professional organizations (especially those that are tied to specific subject areas), district and county administrators, and professors.

Although the following overview focuses on the development of the third-grade test of basic skills in the 1970s, it illustrates the general process by which CAP tests are designed. During the initial phase of designing the Grade three test, the content area assessment advisory committees looked to the guiding philosophy of the curriculum frameworks and content analyses of commonly used, state-adopted third-grade textbooks in developing preliminary test content specifications (Curriculum, Instruction, and Assessment Division, California Department of Education, 1985). These specifications were then reviewed by representatives from local districts who (a) rated the level of emphasis each proposed skill received in their district's curriculum, and (b) indicated whether or not they felt the skill should be tested. Next, the advisory

committees used the data from this review to make final decisions about the skills to be tested. Once the assessment committees agreed upon test specifications, they began a long, two-year item design and review process involving various combinations of committee members and teachers. Steps in this process included

1. Teachers from throughout the state were invited to write questions that addressed the specifications.

2. The content-area assessment advisory committees and Department of Education staff reviewed and refined the pools of submitted items and insured that they complied with the content specifications.

3. The item pools were then subjected to several rounds of field reviews and pilot tests. During the preliminary field tests, 330 teachers (a) indicated the degree to which they emphasized the skills assessed by specific test items, and (b) judged whether each item should be retained, modified, or omitted.

4. Items that survived a subsequent screening by the advisory committees were then assigned to prototype test forms (using a matrix sample design) and were subjected to a second field test. This round of pilot testing was accompanied by additional reviews of the items by over 600 California teachers.

5. All of these data were considered by the advisory committees during the final selection of items for the Grade 3 survey.

According to the documents describing their rationale and content, similar strategies were followed in designing the Grade 6 Survey of Basic Skills and the more recent tests focusing on specific content areas. For example, more than 700 teachers were involved in the writing and review of items for the Grade 8 science and history-social science tests. This extensive item writing and review process upgrades the quality of the tests and publicizes the pending arrival of new tests. Communication with teachers is further enhanced by the State Department of Education's publication of pamphlets for teachers that describe the content of the tests and provide sample test items.

Ongoing revisions of CAP tests for Grades 3 and 6. Revised tests for Grades 3 and 6 will be introduced during the 1990-91 school year. Both tests will assess achievement in reading, written expression, and mathematics. The

Grade 6 test will also introduce direct writing assessment and will add a new test in history-social science; a new Grade 6 test in science will be added in 1991-1992. Tests introduced in 1990-91 will (a) more closely align with the post-1983 curriculum frameworks, and (b) include open-ended items and performance tasks as well as multiple-choice measures. The new math tests, for example, will include at least some open-ended items that will provide a better sense of students' reasoning. The new sixth-grade history-social science test will feature open-ended, short essay and/or other performance-based questions. The science tests will ask students to engage in hands-on performance tasks, write about science (e.g., describe an experiment), talk about science, and participate in group problem solving. Proposals to introduce other innovative forms of assessment are also being seriously considered. These include

1. developing an integrated test of reading and writing that is entirely performance based.
2. analyzing portfolios of student work accumulated over an extended period of time.
3. observing students engaged in individual or group problem solving tasks (or other forms of performance assessment), and asking probing questions about students' strategies and reasoning.

These new developments will press most elementary school teachers to expand the range of content they currently cover using methodologies that may not be in their current repertoires. According to the authors of the rationale and content statement for the Grade 8 history-social science test (California Assessment Program, 1985), some teachers will welcome this challenge. In their words, "Many teachers made a very strong plea that CAP address 'what should be' and not limit its assessment to 'what presently is'" (p. 9). The Director of the CAP program agrees. In his view, the primary function of the new CAP tests should be to serve as a "target definition" or model of "what instruction should be like." For those teachers who have been through the state's

workshops focusing on the curriculum frameworks, the CAP tests should serve as reinforcement. For others, the tests should serve as an abbreviated statement of the intended curriculum.

The Role of State-Sponsored Inservice Activities

Staff Development Activities Centering on Framework Implementation

California's State Department of Education sponsors a number of professional development activities that are designed to facilitate implementation of the curriculum frameworks and guides. These include (a) regional conferences and other public relations activities to increase teachers' and administrators' awareness of the frameworks, (b) special publications, (c) technical assistance in support of local curriculum reviews, (d) state-level conferences for local curriculum leaders focusing on framework awareness and implementation, (e) activities sponsored by staff development centers for each content area represented by a framework, and (f) modules within the California School Leadership Academy Program that enhance administrators' skills in framework implementation.

Efforts to Enhance Framework Awareness

During the year in which a new framework is released, the State Department of Education sponsors a number of regional conferences throughout the state to increase teachers' and administrators' awareness of the framework. For example, over a period of about three months from February to April 1988, the County Offices of Education and the State Department sponsored eight regional conferences centering on the new framework in history-social science (adopted by the State Board of Education in July 1987). These two-day conferences were planned in cooperation with county offices and featured individuals who played a prominent role in the framework's design.

The State Department's campaign to increase awareness and understanding of a framework's philosophy may also be extended to the general public and/or to selected segments of business and industry. The clearest example of a publicity campaign of this type centered on the release of the new English-Language Arts Framework in 1987. In May 1986, State Superintendent Honig launched the "California Reading Initiative," an initiative that was designed to encourage teachers to integrate quality literature into their reading programs. The Reading Initiative's "Open Books = Open Doors" campaign featured (a) posters for bookstores and classrooms, (b) endorsements by leading publishers, (c) a legislative resolution (Assembly Concurrent Resolution No. 26, July 1987), and (d) other actions designed to increase awareness of the State Department's press for a literature-based, integrated language-arts curriculum. Bookmarks and posters, for example, provided checklists of criteria teachers and administrators could use to review the English-language arts programs in their schools. The first five entries in the bookmark published by the California State Department of Education Language Arts Unit (n.d.) read as follows:

In Our Classroom, We:

- Read, read, read an abundance of books on our own.
- Listen to good literature and read out loud daily.
- Discuss what we hear and read, sharing reactions and relating content and ideas to our own past experiences.
- Engage in all kinds of speaking activities, including storytelling.
- Write daily, for many purposes and in many styles and formats.

Special Publications

The California Reading Initiative was more than a publicity campaign. It also included the development and release of three State Department of Education publications that were designed to help teachers implement

literature-based programs in their classrooms: (a) Recommended Readings in Literature, Kindergarten Through Grade Eight (1986), (b) the English-Language Arts Model Curriculum Guide, Kindergarten Through Grade Eight (1987), and (c) Literature for All Students: A Sourcebook for Teachers. The list of recommended readings was prepared by working groups of teachers, librarians, administrators, curriculum planners, university educators, and members of the superintendent's ethnic advisory panels (Alexander, 1987). It listed 1,010 books and classified each as (a) core literature (to be taught in the classroom), (b) extended literature (potential assignments for individual students), or (c) recreational-motivational literature (works that teachers might recommend for students to read on their own). The list also cited the grade spans in which each work would be most appropriate (e.g., K-2).

The Sourcebook for Teachers was co-published by the University of California and the State Department of Education. It was written by the 95 teachers who participated in the 1985 California Literature Institute (see description below) and highlights their recommendations for implementing the programs and activities that are cited in the English-Language Arts Framework. A comparable State Department publication titled, Practical Ideas for Teaching Writing as a Process (Olsen, 1987) is a compilation of ideas for teaching writing suggested by teachers and others associated with the California Writing Project.

These publications are atypical in the sense that they extend the State Department of Education's level of guidance for teachers beyond that provided by the frameworks and model curriculum guides. Comparable efforts in other subject areas have been more limited. The History-Social Science Unit within the State Department of Education has prepared two publications of this type: (a) Recommended Books and Historical Literature for the History-Social Science Framework (1988), and (b) Technology in the Curriculum Guide for History-Social

Science (1986). The first publication lists books and/or historical literature for each unit of instruction cited in the Framework; the Technology Guide contains annotated lists of software and instructional television materials that have also been mapped against the Framework. Comparable technology guides have also been prepared for each of the other subject areas represented by a framework.

Technical Assistance to Local Districts

According to the manager of the Math-Science Education Unit, the State Department of Education actively seeks external financial resources to enhance the quality of local inservice activities that support the reforms cited in the frameworks. The State Department's professional development role therefore varies in accordance with the level of funding that is available in a specific subject area. When the state or federal funds are available, the State Department of Education typically commissions universities, county offices, and large districts to do the inservices. These units submit proposals to the state for the funds the state has been granted for this purpose (e.g., Federal Public Law 98-377). Occasionally, the state redirects proposals to the federal government. Whenever the State Department plays a role in staffing inservice activities, an attempt is made to pair university people (who have content expertise) with training specialists (who have expertise in methodology and practical applications). To the author's knowledge, the State Department has not made any attempt to prepare published materials for these inservice activities. Rather, those who conduct the inservices develop their own materials based on the curriculum frameworks.

In a similar vein, the State Department typically redirects requests for technical assistance to individuals at the local level or to the county

offices. However, the State Department may provide direct forms of technical assistance during the second and third years following the release of a new framework, when the emphasis is on assessment and planning at the local level. For example, during the 1988-89 and 1989-90 school years, local districts that elect to follow the state's seven-year cycle plan for curriculum reviews will assess where they are in history-social science. According to the manager of The History-Social Science Unit, these reviews will consider the district's curriculum, materials, and staff-development initiatives and should prompt districts to provide inservice activities in areas that need attention. The reviews should also provide a conceptual base for the history-social science textbook adoptions that will mark the completion of the review process. During this two-year period, the State Department of Education will present a total of seven two-day conferences dealing with "how to" assess and plan in history-social science and will occasionally provide other forms of technical assistance when requested.

Invitational Conferences for Local Curriculum Leaders

Since 1988, the State Department of Education and the California Association of County Superintendents of Schools have co-sponsored two-day, invitational State Staff Development and Curriculum Leadership Conferences that have focused squarely on framework implementation. The purpose of each conference is to provide information and training for curriculum leaders who are responsible for implementing a given framework in their local districts. Thus, the conferences are targeted for individuals who play key staff development roles throughout the state (e.g., curriculum area specialists, mentor teachers).

The agenda for the 1989 conference (California State Department of Education, 1989b) illustrates the general format. Held in late February and repeated in early March 1989, the conference was designed to enhance understanding and implementation of the History-Social Science Framework adopted in July 1987. It was organized around three themes: (a) exploring the framework (e.g., significant changes and issues, linkages between grade levels), (b) integrating and correlating the curriculum (e.g., correlation of history-social science with other subject areas), and (c) improving classroom practices (e.g., the student as thinker and researcher, the student as active learner). The conference featured general sessions, workshop sessions, and reaction/action groups. The latter meetings provided opportunities for participants to react to what they had heard regarding each of the three themes and to plan actions they would undertake in each area when they returned to their home districts. The sessions were facilitated by individuals from the county offices and grouped participants from particular geographic areas so that they could meet again in follow-up sessions later in the year.

The California School Leadership Academy Program

Created by Senate Bill 813 and established in 1985, the California School Leadership Academy Program is presented in 11 regional training centers throughout the state The introduction to the 1986 Challenge of Excellence Annual Report suggests that approximately 500 to 600 administrators begin this training each year.

> In contrast to previous administrator training programs, which have focused on management techniques, CSLA's training program is designed to emphasize the instructional and curriculum leadership areas in education. (Agee, 1987, p. 14)

According to an unpublished flyer prepared by the State Department of Education, the overall mission of the program is, "to help aspiring and practicing

school administrators strengthen their instructional leadership skills and strategies in order to improve student learning in California" (The California School Leadership Academy Program, n.d.). Participating administrators spend 15 full days per year for each of three years completing a series of training modules that address this mission. By the end of three years of training, Academy participants will have completed more than 300 hours of instruction, workshops, and follow-through activities (Agee, 1987). Some of this training will focus on the implementation of specific frameworks. Over the period of three years, participants will have worked their way through modules that deal with the implementation of three different frameworks.

Summer Institutes for Teachers

Senate Bill 813 called for the establishment of 15 or more regional Staff Development and Teacher Education and Computer Centers (TEC Centers) "to provide staff development resources to teachers, administrators, other school personnel, and other persons providing services to schools" (State of California, 1983, p. 63). From 1983 through 1987, the TEC Centers coordinated a number of professional development activities at the regional level. Curriculum Implementation Centers (CIC) for each of the framework subject areas were located within the TEC Centers and sponsored most of California's summer institutes for teachers. The basic purpose of the summer institutes was to provide intensive instruction (ranging from two to six full weeks) in teaching within particular content areas. Teachers sometimes received modest compensation for participation (e.g., $600 in mathematics) and could also receive college credit. The goal of most, but not all, institutes was to prepare teachers to assume curriculum leadership roles within their local districts.

During the time frame for this report, the legislature provided funds for at least one summer institute in mathematics, science, writing, literature, social studies, and the visual and performing arts. The state also funded follow-up activities (sponsored by the regional CIC Centers) that provided on-going support for institute participants. However, in 1987, state funding for the TEC Centers and the CICs was dropped, thereby ending full support for summer institutes in all but three subject areas--writing, mathematics, and literature. (The California Writing Project and the Mathematics Project were funded through different legislative sources and were therefore not affected by this change.) In 1987 and 1988, the other summer institutes had limited funding from the state and had to seek financial support from other sources, a condition that led to significant modifications in some institutes and the termination of others.

California Writing Project. As described in the Handbook for Planning an Effective Writing Program (1986), the California Writing Project was begun in 1974 by the University of California, Berkeley with the help of the California State Department of Education. Each year, approximately 400 teachers from elementary to university levels spend six full weeks at one of the project's university sites where they receive intensive training in teaching writing to both students and peers. Project graduates are known as teacher consultants and "serve as in-service education leaders and change agents' in their own and other schools and institutions of higher education" (Handbook Writing Committee, 1986, p. 55). Since the Project's inception, "several hundred" educators have completed this summer training experience.

California Mathematics Project. According to a pamphlet advertising summer institutes in mathematics, the California Mathematics Project was established by the State in 1982 and "offers programs for teachers interested

in leadership roles in mathematics education at all levels and programs for schools interested in improving their mathematics programs," (California Mathematics Project, n.d., p. 1). The project is jointly administered by the University of California and California State University and offers summer institutes (usually about four weeks in duration) at 16 sites on the campuses of these two universities (with approximately 25 to 40 participants at each site). Although each of the 16 sites has its own format and approach, all emphasize the development of mathematical understanding, leadership skills, and techniques for working with adults. Each site also seeks to develop a broader repertoire of teaching, including (a) teaching non-routine problem solving, (b) cooperative learning, and (c) use of technology as a mathematics tool.

According to the pamphlet's authors, the most important benefits of the summer institutes are

> the ideas, methods and experiences (participants) will share with other mathematics teachers-leaders and university mathematicians. Past participants have sustained contact with each other through the academic year and beyond; offering each other help and perspective as they try new ideas in their classrooms and in staff development programs. Past participants have frequently emerged as leaders in their regions and statewide. (California Mathematics Project, n.d., p. 3)

California Literature Project. The California Literature Project offers four-week summer institutes to about 400 English-language arts teachers each year at four California State University campuses. Like the others, the summer institutes in literature offer intense training, with the expectation that graduates will function as leaders in local schools. Thus, the Project has also offered six days of follow-up activities during each of the two academic years that follow. Follow-up activities focus primarily on training graduates in working with other teachers.

In contrast to the writing and mathematics institutes, the summer institutes in literature focus directly on implementation of the English-Language Arts Framework. According to a February 12, 1988 memorandum coauthored by the project's director and two administrators in the State Department of Education, the 1988 institutes provided opportunities for participants "to explore the implications of the Framework, to develop their own instructional units, and to plan for implementation." In appealing to school districts to provide financial support for the institutes, the memorandum's authors note,

> By sponsoring teachers, preferably a team of two to four, to participate in the California Literature Project Summer Institute, you will gain teachers with increased expertise in the teaching of English-language arts. The teachers will be able to:
>
> - provide classroom demonstrations of what the Framework looks like when it is carried out in the classroom,
> - provide on-site workshops and coaching for other teachers,
> - continue to increase their expertise by receiving updated information about Framework implementation strategies and materials. (Barr, 1988, p. 2.)

This completes the summary of the elements of California's policy framework to encourage elementary school teachers to teach for understanding and thinking. The discussion will now shift to the author's qualitative assessment of these policy initiatives.

III. A QUALITATIVE REVIEW OF CALIFORNIA'S REFORM INITIATIVES

In summarizing what we had learned from some of our earlier work in the Institute for Research on Teaching, we concluded that curriculum-related policies are most likely to influence teachers' content decisions when they are consistent, prescriptive, and authoritative (see Porter, Floden, Freeman, Schmidt, & Schwille, 1987). Policy frameworks are consistent to the extent that the independent initiatives (e.g., frameworks and tests) align with one another and

are mutually reinforcing. Content tested in the California Assessment Program, for example, may or may not be the same as that described in the curriculum frameworks. Policies are prescriptive to the extent that they provide comprehensive and specific descriptions of what teachers are expected to do. For example, describing the ways in which teachers should use state approved textbooks is more prescriptive than simply releasing a list of approved texts with no guidance about how these materials should be used. Finally, policies have authority to the extent that teachers are persuaded to comply with their provisions. Policies may gain authority through appeal to law or rule, consistency with social norms, agreement with relevant expert knowledge, or support from charismatic individuals (Spady & Mitchell, 1979). In general, appeals to authority may be viewed as attempts to persuade teachers that a policy has merit, and thus to bring about their willing compliance in policy implementation. These appeals differ from appeals to power in that the latter center on the use of rewards and/or sanctions to gain teachers' compliance. (For comprehensive discussions of the attributes of state and district policies, see Floden et al., 1988 or Schwille et al., 1988).

This section of the report will provide an overview of the author's assessment of the consistency, prescriptiveness, and authority of California's curriculum reform initiatives. An important caveat to note is that these analyses were based on data that were limited to (a) documents cited in the Section IV of this report and (b) telephone interviews with eight specialists in the California Department of Education. Whereas these sources typically provided an adequate base for judging the consistency and prescriptiveness of policies within a given subject area, they did not provide a full account of appeals to authority (e.g., level of support from charismatic individuals). Likewise, the data base for this analysis was limited to descriptions of intended policies

and practices; it did not consider the ways in which policies are enacted within local districts and schools.

Are the Policies Consistent?

The issue of consistency across policy initiatives will be addressed from two perspectives: (a) Are the six policy initiatives (frameworks, handbooks, K-8 curriculum guides, CAP tests, instructional materials adoptions, and staff development initiatives) mutually reinforcing? and (b) Are the state's efforts to promote curriculum reform emphasized to a greater extent in some subject areas than in others (e.g., mathematics vs. social studies)?

Are the Initiatives Mutually Reinforcing?

Whereas the curriculum reform initiatives in most states across the nation may be characterized as fragmented and incomplete (see Freeman, 1989), California's reform policies are both comprehensive and carefully orchestrated. Since the passage of Senate Bill 813 in 1983, there has been a clear and consistent commitment to designing curriculum reform policies that (a) press elementary school teachers to teach for understanding and thinking, and (b) align with one another. Moreover, as noted in the introduction, the seven-year cycle plan for curriculum review and Superintendent Honig's consistent direction have ensured that California's curriculum reform guidelines are introduced in a carefully considered and predictable manner.

Given the number of distinct pieces in California's policy framework and the length of time required for the development of each, the level of consistency across different policy initiatives is remarkably high. When assessed in relatively general terms, all six areas of policy activity--frameworks, handbooks, K-8 guides, CAP tests, textbook adoptions, and inservice programs--promote teaching for understanding and thinking in complementary and consistent

ways. Moreover, all consistently advance certain views of human learning and instruction, including the following:

1. Because all students have the ability to attain higher order outcomes, all should have equal access to the core curriculum within each subject area.

2. It is possible to successfully integrate instruction focusing on both higher order outcomes and basic skills (i.e., students do not have to master basic skills as a requisite for problem solving or other aspects of higher order thinking).

3. Instruction should be integrated within and between subject areas; concepts and skills should not be taught in isolation.

Because these themes are voiced loudly and clearly across all policy fronts, it is reasonable to assert that California's curriculum reform initiatives align with one another when alignment is assessed at this level of generality. However, when levels of consistency are assessed in terms of finer grained criteria, a few mismatches are evident. The most noteworthy of these is the lack of alignment between the content covered in CAP tests for the elementary grades and expectations for student learning portrayed in recent revisions of curriculum frameworks in mathematics and English-language arts. The 3rd- and 6th- grade CAP tests were designed prior to 1982 and emphasize basic knowledge and skills in reading, writing, and mathematics. Beyond their modest levels of attention to problem solving, thinking, and understanding, neither of these tests currently aligns with the intended curriculum described in more recent frameworks and other policy initiatives in mathematics and English-language arts. In fact one could argue that these two tests were clearly out of sync with other policy initiatives throughout the time frame for this report. However, by the close of 1988, efforts were underway to revamp the 3rd- and 6th-grade tests to more closely align with the new frameworks, including those in science and history-social science.

Other inconsistencies across policies stem from shifts or refinements in the authors' ways of thinking about content and teaching within specific subject areas. The Mathematics Framework and K-8 Curriculum Guide probably provide the clearest illustration of this phenomenon. Whereas the descriptions of expectations for student learning in the Framework can be characterized as fragmented and somewhat inconsistent, the more recent K-8 Curriculum Guide describes intended outcomes in comprehensive terms. The Framework, for example, describes expectations for student learning in three different ways--as major concepts to be learned, as special concerns, and as lists of instructional objectives. Yet, none of these descriptions bears much resemblance to the list of 27 "essential understandings" that are cited in the more recent K-8 Curriculum Guide. It is evident that the more recent document reflects a refinement in the ways the authors think about the intended outcomes of the mathematics program. Yet, the authors of the Guide fail to note that these descriptions should supersede those provided in the Framework.

Is the Press for Reforms Stronger in Some Subject Areas Than in Others?

Table 4 describes variations in the number and type of reform initiatives that have been introduced across different subject areas. As these data indicate, some subjects have received more attention than others. At one end of the continuum, the intended programs of instruction in mathematics and English-language arts are portrayed across all six policy fronts--frameworks, handbooks, K-8 curriculum guides, CAP tests, recent textbook adoptions, and summer institutes. The intended curriculum in literature has probably received the most attention, particularly across the subset of initiatives that are directed toward teachers (e.g., K-8 Curriculum Guides, summer institutes and special publications).

Table 4

Variations in Policy Initiatives Across Subject Areas

	Science	Math	English-Language Arts	History-Social Studies	Visual Perf. Arts
1. Frameworks	1984	1985	1987	1988	(1989)
2. Handbooks		1982	1988		
3. K-8 Curriculum Guides	1987	1987	1988	(1989)	(1990)
4. CAP Tests					
-Current: Grade 3		1980	1980		
Grade 6		1982	1982		
-Forthcoming: Grade 3		(1990)	(1990)		
Grade 6	(1990)	(1990)	(1990)	(1990)	
5. Textbook Adoptions	1985	1986	1987	(1990)	(1989)
6. Summer Institutes?[a]	Disc	Yes	Yes	(1989)	(Yes)
7. Special Publications for Teachers?			Yes	Yes	

[a]Disc = Discontinued in 1987; (1989) = will be reinstated in 1989; (Yes) = Yes with modifications due to limited funding.

At the other end of the continuum, the intended curriculum in the visual and performing arts received limited attention throughout the time frame for this report (1983-1988). Prior to 1989, state guidelines for instruction in this field at the elementary school level were communicated through only one published source; namely, the Curriculum Framework released in 1982. Although summer institutes were held in 1986 and 1987, these offerings were attended by less than 100 teachers and were modified the following year due to a lack of funds from the legislature.

And, even by the close of 1988, there were no definitive plans to expand the CAP program to include the arts. Yet, according to the visual and performing arts consultant in the State Department of Education, four different professional organizations were working on the development of a bank of items for the 6th-grade test. Thus, it comes as no surprise that Recommendation 5 of the report of the Arts Education Advisory Committee (created by Superintendent Honig) reads, "Student achievement in the arts shall be assessed and programs evaluated in a manner consistent with other curriculum areas" (California State Department of Education, 1989a, p. 8). Simply stated, until this recommendation is adopted, it is unlikely that the visual and performing arts will attain parity with the other subject areas in California's core curriculum.

Nevertheless, there were clear signs by the end of 1988 that efforts to enhance the status of the arts within California's core curriculum were gaining momentum. For example, in 1988 three different arts education task forces prepared reports of recommendations (including the report noted above). Likewise, three events scheduled for 1989--the reprinting of the 1982 Framework, state adoptions of instructional materials for the arts, and publication of the K-8 Curriculum Guide--were expected to add considerable impetus to this movement.

Are the Policies Prescriptive?

As noted in the introduction, policies are prescriptive to the extent that they provide comprehensive and detailed descriptions of what teachers are expected to do.

Are the Guidelines Comprehensive?

California's curriculum guidelines are comprehensive, both in terms of the range of subject areas they represent and in the range of content and instruction they consider within each subject. Whereas a majority of states restrict their descriptions of the intended curriculum to the subject areas represented by the three basic skills--reading, writing, and mathematics--California provides guidelines for instruction in seven different subjects--science, mathematics, English-language arts, foreign languages, health, history-social science, and the visual and performing arts. Moreover, California's curriculum-related documents provide descriptions of the full range of content to be covered within each of these subjects. In contrast, most of the other states are content to describe a more restricted range of "minimum competencies" or "essential skills" that students are expected to master.

Although the vast majority of states also restrict their descriptions of the intended curriculum to lists of instructional goals and objectives, California's policies describe both what should be taught and how it should be taught. The K-8 Curriculum Guides in science, mathematics, and English-language arts, for example, provide specific examples of the kinds of lessons teachers can use to engage students in higher order thinking. Likewise, the narrative descriptions of K-12 courses in the History-Social Science Framework provide relatively detailed descriptions of how to teach as well as what to teach. According to the results of our 50-state survey, only one other active

curriculum reform state (Missouri) attempts to describe both content and instruction. Therefore, it is reasonable to assert that California's guidelines for curriculum reform are more comprehensive than those in any other state.

Nevertheless, there are clear limits to the range of concerns that are adequately addressed across California's curriculum-related documents. To date, the most important limitation in my view is the failure to address adequately critical issues and desired practices related to the assessment of student learning. Even though the authors of the various policy documents recognize that assessment must align with both content and instruction, the question of how to assess student achievement is considered in relatively sketchy and incomplete terms. For example, only two of the four frameworks that were published from 1983 to 1988 (mathematics and English-language arts) include a section that spells out guidelines for assessing student learning. And, the description of desired assessment practices in one of these documents (mathematics) is very general. Whereas some might argue that the examples of questions that are cited in the K-8 Curriculum Guides in science, mathematics, and English-language arts could provide guidance in designing either formal or informal assessments of student learning, that point is not emphasized in any of these documents. Rather, the focus of each example is clearly on instruction and not on student assessment.

With the exception of the English-Language Arts Framework, the most prominent place in which the issue of student assessment is addressed is in the list of standards for evaluating instructional materials that are presented in each framework. The History-Social Science Framework, for example, limits its discussion of student assessment to a list of four standards focusing on assessment and evaluation that are to be considered in reviewing instructional materials for state adoption. In general, the authors of the various curriculum

guidelines seem to assume that curriculum embedded tests and activities will provide an adequate base for both formal and informal assessments of student achievement.

Are Curriculum Guidelines Described in Specific Terms?

In addition to being comprehensive, prescriptive policies provide detailed descriptions of what teachers are expected to do (i.e., detailed descriptions of what to teach, how to teach, and how to assess student learning). In this regard, California's descriptions of desired practice are qualitatively different from those of any other state (see Freeman, 1989). To the author's knowledge, all of the other states that seek to communicate directly with teachers portray desired learning outcomes as lists of instructional goals and objectives. California stands alone in making a clear break from this traditional practice. In the most recent curriculum frameworks (English-language arts and history-social science), the intended curriculum is described in relatively general, narrative terms with no delineation between what should be taught and how it should be taught. Moreover, there are no clear parallels between these narrative descriptions and statements of distinct goals and objectives. In other words, the narratives provide relatively general, rather than detailed, descriptions of what should be taught.

It is evident from a variety of sources (e.g., critique of an earlier draft of this manuscript by the director of the Office of Humanities) that the decision to describe the intended curriculum in terms of models or general guidelines rather than as specific prescriptions was deliberate. The apparent intent in describing the intended curriculum in more general terms was to move teachers away from the traditional skills-based curriculum in which concepts and skills are taught in isolation, toward a meaning-based curriculum in which

skills are taught in context and holistic, integrated approaches to instruction are emphasized.

According to the director, the California Assessment Program is also attempting to move teachers away from traditional uses of assessment data. Here, the standard practice is for teachers to use test results to identify specific objectives for which student scores are low, to then develop lessons that address these objectives, and to ultimately present these lessons in isolation. This diagnostic-prescriptive approach runs counter to the holistic orientations to instruction portrayed in the frameworks. Thus, he hopes that the ways in which the CAP test results have been used in the past will change. In his view, the tests should now serve as models for "what instruction should be like" and should reinforce the successful implementation of integrated approaches to instruction. From this perspective, low test scores will trigger general adjustments in the instructional program (e.g., provide more practice in a certain type of writing) and not isolated efforts to improve students' skills.

As this discussion suggests, California's curriculum reform guidelines provide a general sense of direction; they do not provide descriptions of what teachers are expected to teach that are as detailed as stated goals and objectives. In this sense, California's curriculum reform guidelines are less prescriptive than those in other states. One may, therefore, question how teachers who have come to rely on detailed directives (those who plan and implement instruction that focuses on specific objectives) will gain a clear sense of what and how to teach. An optimistic answer is that teachers will acquire this direction (a) through participation in professional development activities (provided by individuals who have attended the state's invitational conferences for curriculum leaders or those who have participated in the summer institutes) in which they experience the subject in ways that are portrayed in the

framework, (b) by studying the exemplary lessons in the K-8 curriculum guides and other publications of the State Department of Education, and (c) by reviewing the item specifications for the CAP tests for their respective grade levels. A more realistic answer, in my view, is that most teachers will gain this sense of direction by following their textbooks or other state-approved materials closely. If state-approved textbooks and other materials align with the curriculum frameworks, adherence to these materials should lead to effective practice (as defined by the frameworks).

But, even those teachers who follow their textbooks closely are likely to encounter at least some uncertainties. For example, some proposed lessons or activities may overestimate some teachers' level of understanding of the subject matter or the adequacy of their personal experiences related to that which is being taught. Some lessons may also call for instructional routines that some teachers have never practiced. Districts will, therefore, need to provide inservices that focus primarily on teachers' successful use of state-approved textbooks and other materials. Ideally, these inservices will be presented by individuals who have been trained in state conferences or summer institutes or by those who have gained a thorough understanding of the frameworks and curriculum guides through some other means.

Assuming that local inservice programs are successful, one might ask what role the CAP tests will play in a textbook driven curriculum. Simply stated, updated versions of the CAP tests will reward those districts that select the textbook series or other materials that most closely align with the framework for a given subject area. If teachers follow these textbooks or materials closely, and CAP tests also align with the framework, there will be a better match between content taught and content tested in their districts than will be true in districts that select other instructional materials.

Are the Policies Authoritative?

Policy initiatives, both consistent and prescriptive, may nevertheless function as weak proposals. Another critical step in enhancing the strength of a state's curriculum guidelines is to increase their legal, social, expert, and charismatic authority. As noted earlier, the data base does not provide an adequate source for assessing the level of support from charismatic leaders.

Legal Authority

Policies gain legal authority through appeals to laws or rules. These appeals are especially important sources of authority in that they convey a sense of obligation rather than a more subtle form of persuasion. As outlined in the introductory section of this report, most of the initiatives in California's curriculum reform proposals are backed by legislative statutes:

1. Article IX, Section 7.5 of the Constitution of the State of California charged the State Board of Education with the legal responsibility to adopt textbooks and other instructional materials for use in California's elementary and middle schools (Grades K through 8).

2. Senate Bill 1 (Chapter 182) passed in 1968 acknowledged the need for the state to set "broad minimum standards and guidelines for educational programs" across the state and thereby paved the way for the State Board of Education's development of curriculum frameworks.

3. The legal authority of the California Assessment Program was grounded in a series of legislative acts (see Curriculum, Instruction, and Assessment Division, California State Department of Education, 1985). The Miller-Unruh Basic Reading Act of 1965 required statewide testing in grades one, two, and three. The California Testing Act of 1969 mandated the State Board of Education to obtain accurate estimates of students' basic skills performance in Grades 6 and 12. Legislation passed in 1972 permitted the state to develop its own tests. Finally, the Hughes-Hart Educational Reform Act of 1983 extended the statewide testing program to consider academic subjects beyond reading, writing, and mathematics and to test in Grades 3, 8 and 10, as well as in Grades 6 and 12 (State of California, 1983).

4. The Educational Reform Act of 1983 also called for the establishment of Teacher Education and Computer (TEC) Centers. From 1983 through 1987, these Centers played a critical role in the state's provision of professional development activities for teachers, including oversight for summer institutes in the various subject areas. This act also established the

California School Leadership Academy Program which provides training in framework implementation for local administrators.

The only policy initiatives that were not backed by legislative statutes were the creation of Handbooks and K-8 Curriculum Guides. Both of these series were initiated by the State Department of Education. Nevertheless, there is an indirect source of legal authority for the Curriculum Guides. Among its various proposals for upgrading the quality of high school programs, Senate Bill 813 required the State Board of Education to publish Model Curriculum Standards for Grades 9 through 12. An expressed purpose of the K-8 Curriculum Guides was to extend the Model Curriculum Standards to the elementary and middle school levels. Thus, it comes as no surprise that the forward to each K-8 Guide makes a direct reference to this link between Model Standards and Guides.

In contrast to the K-8 Curriculum Guides, the Handbooks lack even an indirect appeal to legal authority. Therefore, the introductory sections rely on appeals to social authority. Superintendent Honig's foreward to the Handbook for Preparing an Effective Writing Program (1986), for example, notes that

> Several of those who worked on this publication are associated with the California Writing Project. Thus, many of the ideas in the handbook reflect the eminent practicality and effectiveness of that project. (p.v)

And, the Preface to the Writing Handbook asserts

> We are especially pleased that this handbook which is now in its third printing has been so well received not only in California but also in other parts of the country. According to the Bureau of Publications, over 75,000 copies of this handbook are now in use, and in 1984 the Education Press Association of America awarded the handbook and its preparers distinguished achievement awards in recognition of the writing, editing, and graphics in the document. (p. viii)

Social Authority

Policies gain social authority through (a) continuity with the way things have always been done (tradition) or (b) widespread support from those who have

a vested interest in their implementation. Because California's curriculum reform proposals represent a clear break from traditional practice, they must appeal to sources of social authority other than tradition. These appeals have generally taken the form of efforts to ensure that each initiative is (a) designed by individuals who represent each of the principal stakeholder groups--teachers, district-level administrators, county offices, universities, and the public and (b) supported by professional organizations.

As noted throughout the report, every panel or committee that is charged with the design or implementation of a specific curriculum initiative (e.g., Curriculum Framework and Criteria Committees; Instructional Materials Evaluation Panels) is carefully constituted to ensure that all principal stakeholders are represented. Steps are also taken to ensure that there is ethnic and regional representation among the participants. The 1985 edition of the Mathematics Framework, for example, was prepared by a committee of 23 mathematics educators from throughout the state of California. The committee included seven K-12 teachers, three mathematics coordinators/consultants from district or county offices, six mathematics professors, two principals, one assistant superintendent, two staff development specialists, a testing and evaluation consultant, and a corporate training specialist. Although they were not formal members of the committee, the director of Mathematics Education and other consultants within the State Department of Education also played an active role in the framework's design.

Since teachers will ultimately determine the fate of each curriculum initiative, it is important to note that practicing classroom teachers were adequately represented on each of the curriculum development committees the author reviewed. Teachers were better represented in the design of CAP tests than in any other policy area. Here, teachers not only served on the Content Area

Assessment Advisory Committees, they also participated in large numbers in the development and review of individual test items. More than 700 teachers, for example, were involved in the writing and reviewing of items for the Grade 8 science and history-social science tests.

Support from Professional Organizations

Another important way in which California's policies appeal to both social and expert authority is through the active involvement and support of professional organizations, particularly those organizations that are associated with specific subject areas. According to the manager of the Math-Science Education Unit, the ultimate success of California's curriculum reform effort will be due in large part to the prominent role of professional organizations within each subject area. A clear illustration of this involvement is in the visual and performing arts. Here, the list of supporting organizations includes the Getty Center for Education in the Arts and the four professional arts organizations (art, music, drama, and dance). A number of state-level organizations concerned with the arts have also formed a Legislative Action Coalition for Arts Education. In addition to monitoring and promoting legislation for arts education, four members of the Coalition (California Art Education Association; California Arts Education Association; California Music Education Association; California Dance Education Association) have been active in creating a pool of items that may be used in future CAP tests.

Expert Authority

In addition to garnering input and support from professional organizations, state policymakers have attempted to enhance expert authority by (a) ensuring that individual members of the various oversight committees have up-to-date subject-area expertise, (b) balancing committee membership to include

individuals with both practical and theoretical expertise, and (c) calling special attention to the roles of recognized national authorities in designing some initiatives.

The first form of appeal is illustrated in the policies and procedures governing the selection of individuals to serve on Curriculum Framework and Criteria Committees. As described in the State Department of Education publication titled, Instructional Materials and Framework Adoption: Policies and Procedures (Office of Curriculum Framework and Textbook Development, 1988), selection criteria call for a balance of educational levels, gender, geographical location, and ethnicity. However, subject matter expertise ranks as the "primary qualification for committee membership" (p. 5). The same is true in regard to membership on the Instructional Materials Evaluation Panels.

By representing all of the principal stakeholder groups, committees are also constituted in ways that ensure a balance between practical and theoretical expertise. As illustrated by the composition of the Mathematics Curriculum Framework and Criteria Committee described above, each committee includes practicing classroom teachers and administrators who lend practical expertise and subject area consultants and university professors who contribute knowledge of research and theory.

Finally, in efforts to appeal to the third source of expert authority, the State Department of Education has occasionally drawn special attention to the roles played by nationally prominent educators in the design of specific initiatives. The foreword to the Handbook for Planning an Effective Mathematics Program (Iddins, Silvia, & Walker, 1982), for example, suggests that the "eminent mathematician and educator, George Polya . . . honored us with several hours of interaction with the handbook writing committee and shared many profound concepts, which the committee incorporated into its description of

high quality mathematics programs" (p. v). More recently, the State Department highlighted the roles of Professors Charlotte Crabtree and Diane Ravitch in the design of the History-Social Science Framework (1987). These two individuals played a significant role in the preparation of the Framework and were later featured at each of the state-sponsored regional conferences to increase framework awareness.

As this discussion of authority implies, the framers of California's curriculum policies have been sensitive to the need to enlist teachers' voluntary compliance in implementing the calls for curriculum reform. In the authors' view, efforts to ensure that the policy guidelines have legal, social, and expert authority have been both comprehensive and appropriate. In other words, there have not been any obvious oversights in efforts to persuade teachers that California's guidelines for curriculum reform have merit.

Concluding Statement

California's efforts to promote teaching for understanding and thinking are state of the art. The call for curriculum reform in California's elementary schools is bold and far-reaching. It challenges teachers to take a giant step beyond the approaches to instruction that characterize contemporary educational practice--to move from a curriculum in which skills are taught in isolation to a curriculum in which knowledge, skills, and student understanding are taught in a dynamic and integrated context. This call for reform is supported by the most recent research literature in cognitive psychology, including those studies that demonstrate that students do not have to master basics as a requisite for higher order learning (see Lanier & Sedlak, 1989).

Yet, it remains to be seen whether California's curriculum reform initiatives will have a significant influence on teachers' instructional practices.

Judging from the analyses presented in this report, there is reason to believe that each of the reform initiatives (e.g., new forms of statewide assessment) will have at least some impact on classroom practice. Nevertheless, if this author's conjectures are sound, state-approved textbooks and materials will determine teachers' enactment of the curriculum across most elementary school classrooms. If this is true, the ultimate effects of California's reform proposals will be a direct function of the state's success in (a) pressing publishers to develop instructional materials that align with the curriculum frameworks and (b) providing appropriate staff development activities to encourage and support teachers' successful use of those materials.

Regardless of the final outcome, those who have shaped California's curriculum reform proposals should be commended for their leadership and commitment to the task. The lessons learned from their ambitious endeavors are almost certain to have a subsequent powerful impact on educational theory and practice nationwide.

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